Technical Report # 1602

Innovation Need Survey: Implementing a Technology Tool to Improve Early Data-based Decisions to Address and Prevent Learning Disabilities

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Project ICEBERG: Innovation Needs Survey, Fall 2015

Executive Summary

Purpose

To learn about the field's readiness to implement a tablet-based early screening system designed to support teacher decision-making and improve learning outcomes in preschool and kindergarten settings, based on input from Oregon early learning professionals.

Survey Respondents

50 professionals serving in Oregon (educators, specialists, administrators, and coordinators), with 41 serving in a preschool role, 7 serving in a kindergarten role, and 2 others.

Key Findings

- **Early screening viewed as critical to identifying and meeting the learning needs of struggling preschool and kindergarten children.**

- **Six primary practice shortcomings noted:**
  - Gaps in screening and eligibility processes/policy
  - Insufficient funding and resources
  - Deficiencies in teacher assessment and instructional pedagogy
  - Lack of parental awareness of screening and associated follow-up services, and concerns about stigma attached to disability identification
  - Poor alignment between preschool and kindergarten systems
  - Inequitable access to high-quality preschooling for at-risk populations

- **Kindergarten teachers generally perceived as having greater knowledge and skills for identifying risk for early learning difficulties than early learning providers.**

- A**dditional funding and ongoing professional development needs identified**:
  - Improving teachers' early screening and instructional knowledge and skills;
  - Supporting integration of a tablet assessment for instruction tool into teaching practices to strengthen learning outcomes; and
  - Overcoming contextual obstacles unique to preschool and kindergarten settings.

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Identifying and measuring indicators of learning difficulties among young children and implementing effective instructional approaches are complicated, particularly during the transition to kindergarten (Barnett, Riley-Ayers, & Francis, 2015; Greenwood, Carta, & McConnell, 2011). Though expansion of early childhood and preschool services, particularly state-funded programming, has provided a growing opportunity to identify and support children early on who are at risk of developing learning difficulties (Barnett & Carolan, 2013), vital resources for such efforts, including those related to implementing and supporting effective data-based decision-making and instructional practices, are underprovided in preschools (Cunningham, Zibulsky, & Callahan, 2009; Early et al., 2007; Greenwood et al., 2012). Such resources are more widely available in kindergarten settings and beyond (O'Connor & Freeman, 2012; U.S. Department of Education, 2009), creating a disparity in the availability of essential programmatic resources and teacher supports across the two learning environments.

Purposeful school-based transition policies and practices support teacher and school decision-making and, thus, can ease the preschool-to-kindergarten transition and improve student reading and mathematics outcomes early in children's schooling (Schulting, Malone, & Dodge, 2005). More specifically, to unify learning difficulty prevention approaches and resource allocation across preschool and kindergarten environments, assessment, instructional, and intervention strategies should be better aligned and narrowly focused on developmentally appropriate cognitive and academic outcomes predictive of later success (National Association for the Education of Young Children, 2009). Additionally, resource disparities, including those associated with bolstering instructional effectiveness and related professional development

supports for educators, must be addressed to meet struggling students' needs (Barnett & Carolan, 2013). Reynolds, Magnuson, and Ou (2010) succinctly summarized the importance of bridging preschool-kindergarten experiential contexts, arguing that planful alignment of resources and strategies across the preschool into kindergarten transition is an important pretext for building on early learning experiences for improved student outcomes across early elementary schooling.

For more than a decade researchers have documented evidence that supporting teachers in the use and interpretation of student assessment data yields improved results on important student outcomes (Greenwood, 1999; National Institute for Literacy, 2008; Tindal, 2013; U.S. Department of Education, 2009). For example, when Capizzi and Fuchs (2005) provided elementary teachers with timely and diagnostic instructional feedback and connected professional development, teachers more effectively used student assessment data as a basis for planning and selecting instructional and intervention strategies that appropriately targeted the learning needs of both general and special education students. Moreover, web-based technology tools that provide timely access to student performance data and guidance around teachers' instructional decision making are potentially an important support that can make learning difficulty prevention for individual students across preschool and kindergarten learning environments more efficient and effective (Abbott, Greenwood, Buzhardt, & Tapia, 2006; Buzhardt et al., 2010; Connor, Morrison, Fishman, Schatschneider, & Underwood, 2007).

Yet, technologies are not without implementation and integration challenges in preschool and K-12 contexts. Though computer technologies are more ubiquitously available to teachers and students in schools compared to previous decades, there is no clear definition of what is meant by teachers' use of technology, which makes measuring and evaluating implementation and integration, or the extent and manner in which teachers' assimilate technology into their

everyday practices, difficult and contextually grounded (Bebell, Russell, & O'Dwyer, 2004). Successful implementation and integration of technology supports across K-12 learning contexts appears dependent on *institutional factors* such as the resource availability (e.g., funding for the technology, its upkeep, and needed upgrades) and administrative policies and support; however, *personnel-related issues* such as teachers' attitudes and beliefs toward technology, and pedagogical knowledge and skillsets are also important factors (Hew & Brush, 2007).

In preschool settings similar barriers to successful technology implementation and integration abound. Inadequate resources, insufficient technical assistance, few available intervention strategies and evidence-based curricula, weak pedagogical knowledge, and insufficient support from administration limit the effectiveness of using technological tools in preschool contexts (Cunningham et al., 2009; Greenwood et al., 2011). Additionally, though technology integration might bring certain efficiencies (e.g., straightforward access to student data and performance visualizations), teachers typically lack sufficient time for assessment administration and data-driven decision making and instructional practices (Menzies, Mahdavi, & Lewis, 2008; Roehrig, Duggar, Moats, Glover, & Mincey, 2008), placing additional pressure on the long-term sustainability of associated technology implementation and integration. Thus, when implementing technologies to help preschool and kindergarten teachers more effectively collect and use student assessment data as a basis for instructional practices, emphasis must be placed on addressing obstacles to this process. Building a seamless vision of technology integration, providing necessary short- and long-term funding and resources, and working to improve teachers' related attitudes, beliefs, knowledge and skillsets are among the obstacles that commonly need to be addressed (Hew & Brush, 2007).

In this technical report, we present results from a survey of educators, specialists, administrators, and coordinators, designed to learn more about the field's readiness to implement a tablet-based screening tool to support and improve teacher data-based decision making in preschool and kindergarten learning contexts. In particular, we sought professional opinions from Oregon stakeholders to help us identify implementation strategies, including those related to obstacles to sustainable integration, as part of Project ICEBERG (Intensifying Cognition, Early literacy and Behavior for Exceptional Reading Growth), a project funded by the Office of Special Education Programs (OSEP). The primary purpose of Project ICEBERG is to develop strategies and resources to guide preschool and kindergarten teachers' instructional decisions and reduce children's risk for reading disabilities through the implementation of a newly developed web-based assessment tool and associated teacher support system.

Methods

Participant Recruiting and Sampling

We targeted Oregon early learning and kindergarten stakeholders—preschool and kindergarten educators, specialists, administrators, coordinators, and parents—as respondents to the Innovation Need (IN) Survey developed and administered for this study. Incentives were not offered for completing the survey. We used nonprobability sampling to recruit a sample of convenience, and also included a snowball sampling approach. We emailed invitations with embedded access to the secure online survey to individuals known from previous and current research partnerships, and asked these individuals to both complete the survey and to distribute the invitation to their preschool/kindergarten colleagues in Oregon. Additionally, we posted a link to the online survey on two websites: (a) the home page of our research organization , Behavioral Research and Teaching (BRT; http://www.brtprojects.org), and (b) the home pages

for both the *Lite* and *Teacher Deluxe* editions of easyCBM (https://www.easycbm.com), a nationally-available interim/formative assessment system designed and managed by researchers at BRT and the College of Education at the University of Oregon.

Fifty respondents accessed the survey through email invitation and seven respondents through one of the direct web links. Of the email recipients, one respondent answered only the first item, and was removed from the analytic sample for this technical report. Of the seven respondents who accessed the survey through a web link, six were from states other than Oregon (2 CA, 1 CO, 1 DE, 1 FL, 1 MI), and were also not included in this analytic sample. We thus included a total of 50 respondents in the analytic sample.

Table 1 displays frequency counts of survey respondents, based on their self-reported preschool/kindergarten service roles (survey question one; SQ1). Table 2 further specifies these preschool/kindergarten roles using respondents' open-ended comments to SQ1 and survey question two (SQ2). Overall, 41 respondents (82%) had a preschool-related services role, seven respondents (14%) had a kindergarten-related services role, one respondent's role was neither specifically preschool- nor kindergarten-related, and one respondent's role was not discernible as either preschool- or kindergarten-related. The latter two individuals' responses are included in aggregated results only. Of the 41 individuals with a preschool-related role, 18 (44%) served in a self-described administrator/leadership capacity—with 13 serving at a building/program level (i.e., Building administrator, Director, Manager, Supervisor), and six coordinators more broadly serving in a leadership role across multiple early learning settings (i.e., Early Childhood Special Education [ECSE] Coordinator, Early Learning Hub Coordinator). The remaining 22 respondents (54%) serving in a preschool services role worked predominantly as teachers or specialists (i.e., Preschool Educators, Early Intervention Specialists, Speech/Language

Pathologists). Of the seven individuals serving in a kindergarten-related services role, one worked as a Title I coordinator, and six worked as teachers or specialists (i.e., Assistive Technology Specialist, Dyslexia Specialist, Kindergarten Educator, Speech/Language Pathologist). One respondent identified as a parent (and former preschool teacher).

Instrument Design and Administration

We developed the IN survey instrument based on best-practice considerations as outlined in Alonzo and Tindal (2011). In total, 27 items comprised the survey—23 selected response items and 4 constructed response items. We designed selected response items to target a single domain using precise phrasing, positive wording, and unbiased language. For example, we used parallel grammatical structure that avoided jargon, with response options that were mutually exclusive and that covered a range of reasonable replies without leading respondents to particular responses. The first selected response item asked respondents to identify their preschool/kindergarten services role; the remaining 22 selected response items were statements about preschool and kindergarten teachers' professional knowledge, skills, and experiences that used a 5-point ordinal scale (S*trongly Agree*, *Agree*, *Neutral*, *Disagree*, and *Strongly Disagree*). We also provided a sixth response option (*Insufficient Experience to Respond*). We designed constructed response items using neutral and unbiased phrasing that encouraged elaboration over single-word responses. We display the complete IN Survey in the Appendix.

We administered the IN Survey online using SurveyMonkey® from September 30, 2015 to October 30, 2015. When the survey was accessed through either an email invitation or web link, the SurveyMonkey® system assigned each respondent a unique 10-digit code, so that responses could be tracked anonymously and disaggregated. Online, the survey was divided into four separate screens, including a "welcome" page that framed our purpose, provided

instructions, and gave contact information for help with technical difficulties. We required respondents to answer all items. All but one of the 51 respondents working in Oregon who began the IN Survey completed it (98% completion rate). We told respondents that results, in the form of this report, would be posted on the BRT website (http://www.brtprojects.org), or sent to them individually.

Analysis

We prepared and analyzed survey response data using Microsoft Excel 2011 and SPSS 23 (IBM Corp., 2015). We analyzed data for the entire sample and for specific subgroups (i.e., preschool vs. kindergarten services roles; teachers/specialists vs. administrators/early childhood leaders) where appropriate. For constructed response items, two BRT researchers independently examined data for repeated patterns. Each researcher coded patterns into new, more parsimonious, variables and reported frequency counts. We also noted representative quotes illustrative of the patterns identified from constructed responses. For selected response items, we completed frequency counts for each response option category and computed the median score, an appropriate measure of central tendency for non-numeric ordinal response data.

Results

We present results for the IN Survey organized by constructed response item findings, followed by those for selected response items. To maintain respondents' anonymity, we frame representative quotes using one of four professional role categories that cut across preschool and kindergarten environments. The four general categories are defined as follows (see Table 2):

- *Educator* – a respondent serving in a classroom teaching role;
- *Specialist* – a respondent serving in a special (education) services role (e.g., early intervention specialist, speech/language pathologist);

- *Administrator* – a respondent serving in a building or program leadership role (e.g., program director/manager); and
- *Coordinator* – a respondent serving in a leadership role across grades, districts or programs (e.g., ECSE coordinator).

Constructed Response Items

Survey question three (SQ3) prompted respondents to: *Share your thoughts about the importance of early screening information for preventing learning difficulties*. In total, 47 of 50 respondents (94%) indicated that screening was important for identifying and/or preventing learning difficulties. Across all constructed response items, both specific and general responses were provided, which we describe below. Table 3 displays frequency counts and associated percentages for the patterns of responses found for SQ3.

In total, 28 respondents (56%) indicated that early screening information was important for identifying and/or preventing disabilities, with two respondents mentioning that diagnosing disabilities in preschool-aged children, while important, was difficult to accomplish. Twenty-five of these 28 respondents (89%) thought that early screening information was a vital impetus for individualizing support (e.g., meeting student needs and improving student outcomes by providing greater access to curriculum and through learning accommodations). One educator noted, "Early screening info would be very helpful to all [preschool] educators so that they know where to target curriculum objectives. I find that most regular [education] teachers do not have the background/experience to identify the signs of early reading difficulties, and early screenings would help teachers know what to look for and target instruction toward learning goals." Similarly, 7 of these 28 respondents (25%) thought early screening might reduce or prevent the need for special education services later in time through targeted instruction. A specialist noted,

"Being able to target areas of deficit at a young age or augment instruction…can prevent children from falling behind and being considered for special education later."

Other respondents considered the value of early screening information from more of a systems-level perspective. For example, four respondents indicated that early screening information was an important factor in preparing children for transitioning into kindergarten successfully, while three others cited early screening information as a means for improving alignment between preschool and K-12 learning systems. An administrator wrote, "Ensuring that all children are screened for disabilities at a young age is very important. The sooner children receive the support that they need, the more likely they will be kindergarten ready."

Lastly, of the 35 respondents who gave specific reasons for the importance of early screening (those described above), several respondents also argued that desired outcomes would not be met without also providing necessary programmatic resources and targeted services to children in need. For example, one coordinator cited deficient funding as a roadblock to providing services. "We are seeing increased rates of referral due to the emphasis on early screening and incentives for medical providers…but no accompanying increase in funding to deliver services once children are identified. Our service intensity and frequency continues to shrink. We will NOT see improved outcomes for kids if we can't deliver a service 'dosage' at a level reasonably expected to confer benefit." Similarly, a specialist argued that pairing early screening with access to preschool programming is imperative. "It is definitely important to screen for early problems; however, without universal access to preschool, identifying problems is not enough. Children need equal access to high quality education by the age of three."

Of the remaining respondents, 13 (26%) provided a general statement that indicated they thought early screening information was important, but did not provide sufficient detail for

categorizing their response into any specific pattern. Similarly, two respondents, a specialist and an administrator, provided responses of "no comment" and "it depends", respectively.

Survey question four (SQ4) prompted respondents to: *Describe shortcomings in current practices related to the prevention of learning difficulties*. In total, 48 of 50 respondents (96%) cited at least one specific shortcoming in current prevention practices. Two respondents were unsure of any shortcomings. Table 4 displays frequency counts and percentages for the patterns of responses observed for SQ4. It should be noted that respondents often reported more than one particular shortcoming in current prevention practices. Thus, Table 4 displays an aggregate of what the two researchers coding the data discerned was the main theme of each response, while secondary themes are described in what follows. Of the 48 respondents that cited at least one shortcoming, 13 individuals (27%) focused on inadequacies in screening and eligibility processes. More specifically, several people within this group cited a perceived or measurable disconnect between child needs, screening results, and eligibility criteria for services—including state and district policies that might inappropriately limit services for some student groups. For example, an administrator stated, "Not all children meet the eligibility requirements for early childhood special education. There is a group of children that are at risk that do not receive early intervention support of any kind." Three of these 13 individuals specifically mentioned that districts in Oregon do not recognize preschool-aged children as being eligible for special education services until kindergarten if they are identified as having a developmental delay.

Thirteen additional respondents (27%) mentioned a lack of resources, including school/classroom funding and adequate staffing, as an important shortcoming in current practices. A coordinator succinctly summarized this concern stating, "we have a conundrum of early identification without funding for service matched to needs. Also, low wages and high

turnover in [early] child care programs leads to lack of consistency in application of best practices." It is worth noting that most individuals citing a lack of resources and funding reported working in a specialist role. Similarly, 10 respondents (20%) indicated a lack of teacher pedagogical knowledge (e.g., inadequate screening/identification, instructional and curricular planning skills, a lack of screening implementation and buy-in) as shortcomings in current prevention practices. One administrator wrote, "Often instructors are so busy teaching mastery of specific skills (such as naming the letters of the alphabet) instead of identifying the individual needs and abilities of the children, thus preventing them from really identifying the individual strengths and needs of each child…When children are taught according to their individual needs, interest and learning styles, it can prevent children from developing learning difficulties." An educator specifically cited preschool teachers' inability and inexperience at recognizing "warning signs" related to children's reading difficulties as a shortcoming to current practices.

Eight additional respondents (17%) noted parents as contributors to current shortcomings in prevention service models. Some of these respondents perceived that parents lack awareness of screening and related follow-up services available to them. For example, an administrator wrote, "Parents are unaware of the availability of early screening. Additionally, they may not realize their child has a delay or potential learning difficulty." A preschool administrator noted that parents might not lack awareness, but rather, have concerns about stigma surrounding screening and disability identification and, thus, a reluctance to seek needed services:

> We often have parents who balk at having their child screened or assessed…due to the stigma of having a label put into their child's permanent file…More information through pediatricians about testing and the importance of assessments would be helpful. Also, the reluctance to offer services to children with social-

> emotional challenges is discouraging. We often see these challenges as early as 2.5 years, but it can take up [to] two years before the child is…considered for additional assistance.

Three respondents (6%) indicated poor alignment and communication across preschool and kindergarten as a detriment to preventing learning difficulties. One specialist indicated that the two systems focus on disparate student problem areas. Because of this systemic difference in focus across the two learning environments, the specialist argued that important information is lost during the transition from preschool to kindergarten that might help elementary schools better serve incoming kindergarteners:

> There is also little communication between early childhood programs and the elementary schools. The schools look at the early childhood programs as failing because they have students entering kindergarten who are not focused or ready for learning…There is little respect between the two programs and important information is being lost that could help prepare the elementary school for a new kindergartener who struggles with behavior.

Three additional respondents (6%) cited a lack of equitable access to quality preschool as an impediment to providing needed services to young children who may be experiencing learning or behavioral difficulties. One administrator noted, "It is definitely important to screen for early problems; however, without universal access to preschool, identifying problems is not enough. Children need equal access to high quality education by the age of three."

Survey question five (SQ5) prompted respondents to provide their thoughts on: *How might a tablet-based system (e.g., Android, iPad) designed to bring teachers information about their students' learning, behavioral, and cognitive functioning be of benefit in early learning*

environments? Because some respondents gave very specific answers and reasoning to SQ5, whereas others were more vague in their responses, we initially analyzed results to glean whether or not respondents, in general, felt that a tablet-based system would be beneficial in bringing teachers information about their students' learning, behavioral, and cognitive functioning in early learning settings. A majority of respondents, 27 of 50 (54%), indicated that such a system would be *beneficial*, whereas 12 others (24%) were distinctly *unsure* of a tablet system's potential benefit. Eleven other respondents (22%) thought that any potential benefit would be *contingent* on the tool's specific purpose and manner of use (see Table 5).

In total, 31 of 50 respondents (62%) provided detailed responses regarding the potential benefit of a tablet-based system, displayed in Table 6. Many respondents fell into more than one category because individual responses often cited multiple distinct, though equally compelling, reasons. In total, 18 of the 31 (58%) respondents indicated that a tablet-based system would be beneficial for efficiently collecting, evaluating, and reporting student information. One educator described the benefit of using a tablet to collect and evaluate student data, stating, "It would greatly help teachers have [access to] assessments, graphs, and information at their finger tips. This would enable teachers to enter observation data and assessment data immediately." Similarly, another educator wrote, "I think it could be a valuable tool in the classroom. Not only could teachers have easy access to their students' info, but they could use the device for data collection." A coordinator in this group cited the importance of efficiency, indicating that a tablet system "could help providers have quick access to this information. It would have to be user-friendly and easy to access in a room full of preschoolers."

Another 15 of the 31 respondents (48%) providing detailed reasoning mentioned the prospect of using a tablet-based system to identify and meet student needs—either through its

use as an assessment tool or as an aid in developing and planning targeted instruction and interventions. An administrator wrote that a tablet system would provide: "a means for recording and tracking the individual skills and abilities of the children in their classroom. By recording and reviewing this information, teachers will be able to track the individual growth of a child in order to identify the needs of and the learning style of the children in order to gear instructional practices to the actual needs and abilities of the children." Likewise, an educator indicated that a tablet-based system could beneficially provide specific recommendations for addressing learning difficulties, stating, "Teachers could use this technology to track students' progress and development in comparison to 'typical' development. There should also be tools available that will teach educators how to address any learning challenges they come across."

Seven of the 31 respondents (23%) who provided detailed responses indicated that implementing a tablet-based system would be a useful means for communicating student information between stakeholders, including teachers and parents. One specialist wrote, "It would be helpful to use as a data collection system to measure progress on goals. Information and recommendations could be shared easily between teachers, consultants and parents via a tablet-based system." Similarly, another specialist said, "it would be wonderful for there to be an app that both families and teachers could access together—they could communicate via this app, monitor the child's progress, find/share suggestions for how to address learning challenges, etc." One of the specialists considered communication of student information more broadly, stating that a tablet-based tool would be helpful "If there was an universal system where teachers could share *between schools* [emphasis added] progress reports, or data taken on skills."

It is important to note that several respondents also expressed reservations about the use of a tablet-based system in early learning settings. Five respondents (16%), despite citing

potential benefits of using a tablet-based tool, also expressed that using them in the classroom could potentially be distracting to teachers and children if they had access to the tablets in the classroom (as compared to in offices where children are not present). Two other respondents indicated that implementing a tablet-based tool in preschool settings would require considerable professional development training for the tool to be integrated into teachers' practices.

Selected Response Items

Next in the online survey, we grouped selected response items (not including SQ1) into two sets of 11 item prompts each focusing on respondents' views about preschool and kindergarten teachers' knowledge and skills, respectively, using a 5-point ordinal scale (*Disagree Strongly*, *Disagree*, *Neutral*, *Agree*, *Strongly Agree*). A sixth (unscaled) response option was also available (*Insufficient Experience to Respond*). Table 7 displays the 11 preschool teacher related prompts and associated frequency counts for **survey question six (SQ6)**. We identified several patterns in respondents' replies to the selected response items related to preschool teachers' knowledge and skills. It is important to note, however, that preschool respondents heavily weighted the results for SQ6. Recalling that the total sample was already biased in favor of preschool respondents (41 respondents (82%) worked in a preschool-related role while only seven respondents (14%) worked in a kindergarten-related services role), five respondents serving in a kindergarten role (or 71% of kindergarten respondents from the total sample) indicated that they did not have sufficient experience to respond to each of the 11 prompts in SQ6. Although responses ranged across the 5-point scale, when considering whether or not preschool teachers had sufficient information about specific student skill types (the first four prompts in SQ6), respondents were generally *neutral* regarding emergent literacy, math, and aspects of students' behavior (Figures 1 – 3), whereas respondents generally *disagreed* that

preschool teachers had sufficient information regarding students' cognitive functioning (Figure 4). Overall, six respondents (5 of whom were kindergarten respondents) indicated that they had *insufficient experience to respond* to the first four prompts in SQ6.

We observed a similar pattern of responses for the first four prompts in SQ6 for individuals serving in a preschool role compared to all respondents, with the n-size for kindergarten respondents too small to appropriately compare. On the other hand, we observed distinct differences when the analytic sample was disaggregated by *educators/specialists* (individuals teaching and/or delivering special services to children in preschool or kindergarten classrooms) and *administrators/coordinators* (individuals serving in preschool or kindergarten leadership roles at a building, program, or broader level). For example, educators/specialists were predominantly *neutral* about preschool teachers having sufficient information about their students' emergent literacy skills—12 of 26 respondents (46%) were neutral. Alternatively, administrators/coordinators had stronger opinions—14 of 17 respondents (82%) either *disagreed* or *agreed* with the prompt, including one individual who *strongly disagreed* and one who *strongly agreed* (see Figure 1). Whereas, educators/specialists and administrators/coordinators were largely in agreement regarding preschool teachers having sufficient information regarding their students' emergent math skills and cognitive functioning (see Figure 2 and 4, respectively), the two subgroups had different perceptions when it came to students' behavior. Educators/specialists tended to *disagree* that preschool teachers had sufficient information about aspects of their students' behavior—12 of 26 respondents (46%) either *disagreed* or *strongly disagreed*. In contrast, administrators/coordinators tended to agree more—11 of 17 respondents (65%) either *agreed* or *strongly agree*d with this prompt (see Figure 3).

Though responses once again ranged across the five ordinal options for prompts 5-9 in SQ6, respondents generally *disagreed* that preschool teachers were skilled at using student assessment results to support instruction (Figure 5). Respondents also *disagreed* that preschool teachers were skilled at assessing learning risk based on specific student skillsets (Figures 6 – 9). Of those respondents who provided an ordinal rating response, nearly three out of four either *strongly disagreed* or *disagreed* that teachers were skilled at assessing students' learning risk based on their emergent literacy (65%), emergent math (74%), and cognitive functioning skills (70%). Respondents were generally more *neutral* about preschool teachers' skill at using student behavior to assess risk for learning difficulties. We observed similar patterns of responses across all subgroups for prompts 5-9 in SQ6. Again, six respondents (5 of whom were kindergarten respondents) indicated *insufficient experience to respond* to each of prompts 5-9 in SQ6.

When it came to preschool teachers' access to and skill at using tablet devices (prompts 10 and 11 in SQ6), respondents were generally *neutral* (Figures 10 and 11). Interestingly, educator/specialists respondents were generally more *neutral* or in *disagreement* that preschool teachers had access to tablet devices compared to administrators/coordinators, who tended to agree more with the prompt (Figure 10). Nine and eight respondents (5 of whom were kindergarten respondents) indicated they had *insufficient experience to respond* to preschool teacher prompts 10 and 11, respectively.

Table 8 displays the 11 kindergarten teacher related prompts and associated frequency counts for **survey question seven (SQ7)**. Notably, 14 to 20 respondents (28-40% of the entire sample) indicated that they had *insufficient experience to respond* to each of the kindergarten teacher prompts. All of these respondents worked in preschool services roles. Thus, we present results for SQ7 item prompts, including for Figures 12 – 22, for the entire sample only due to

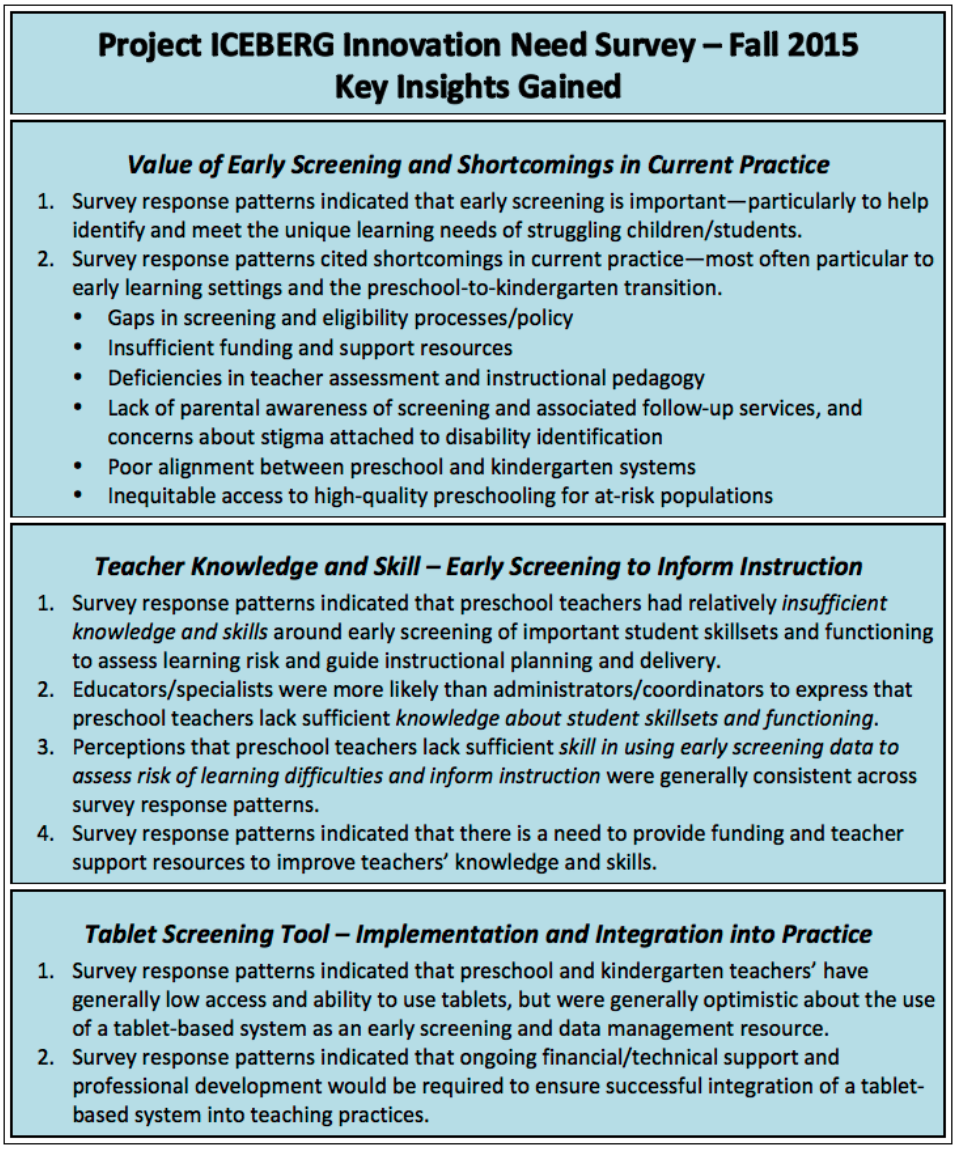
limited subgroup sizes. In contrast to perceptions of preschool teachers, respondents generally *agreed* that kindergarten teachers have sufficient information related to students' emergent literacy, mathematics, and behavioral skills (the first three prompts in SQ7). No respondents *strongly disagreed* with these prompts (Figures 12 – 14). On the other hand, respondents' perceptions about kindergarten teachers having sufficient information about their students' cognitive functioning spread rather evenly across *disagree*, *neutral*, and *agree* response options, with the median response neutral (the fourth prompt in SQ7). No respondents *strongly disagreed* with this prompt (Figure 15).

Generally, respondents agreed that kindergarten teachers were skilled at using student assessment results to support instruction (Figure 16), although they tended to be comparatively more *neutral* about these teacher assessment skills when pertaining to students' emergent literacy and math skills, behavior, and cognitive functioning, with perceptions spread quite evenly across the five ordinal response options for each of prompts 6-9 in SQ7 (Figures 17 – 20). Respondents were generally *neutral* or in *agreement* that kindergarten teachers had access to and skill using tablet devices (kindergarten teacher related prompts 10 and 11 in SQ7; Figures 21 and 22). These two prompts also had the greatest number of (predominantly preschool) respondents indicate that they had *insufficient experience to respond* (20 and 18 respondents, respectively).

Discussion

We administered the IN Survey as part of Project ICEBERG for the purpose of gaining insights into the perceptions of preschool and kindergarten professionals regarding the field's readiness to implement a tablet-based screening tool to support teacher data-based decision making in early learning environments. While the large majority of respondents serving in a preschool-related role heavily weighted the sample, an important qualification that frames our

findings, we gleaned important insights in three main areas (see diagram, below). First, respondents recognized the value of early screening, especially as a basis for identifying and meeting the unique learning needs of struggling preschool and kindergarten students; however, they also noted shortcomings to current practices, often particular to early learning settings and the preschool-to-kindergarten transition. Second, respondents perceived that preschool teachers had less background knowledge and skills around the collection and use of early screening data to assess learning risk and guide their instructional decisions compared to that of kindergarten teachers—though interestingly, perceptions of preschool teachers differed based on whether the respondent worked directly with students (educators/specialists) or served in a broader leadership capacity (administrators/coordinators).



Third, teachers' access to and adeptness at using tablets, generally perceived to be somewhat low by respondents, is an important consideration for implementing a tablet-based screening tool and integrating such a tool into assessment/instructional practices across preschool and kindergarten learning contexts. Findings in these three main areas are discussed in greater detail, below.

Across respondents, there was strong consensus regarding the importance of early screening as a means to identify, address, and possibly prevent students' learning difficulties. Respondents' constructed responses overwhelmingly cited early screening information as an important basis for providing individualized and developmentally appropriate support to students struggling in the classroom; however, respondents also described shortcomings related to current practices in this area. Over two-thirds of respondents cited deficiencies around screening/eligibility, resources/funding, and/or pedagogical knowledge/curricula in current early screening and associated instructional practices. At the forefront of respondents' concerns was a perceived disconnect between screening results and children's eligibility for needed services. Respondents familiar with the use of assessment data to inform eligibility decisions in preschool/early childhood settings expressed some negative perceptions of screening and prevention practices—specifically indicating that children who initially did not qualify for special education services under district or state policies were falling through the cracks as they were forced to struggle academically until they fell far enough behind their peers or below an established criterion to qualify. Another perceived shortcoming in current practice was recognition of insufficient resources and funding within school settings, which perhaps works to limit educators' pedagogical knowledge and the quality of curricula and its implementation also cited by respondents as shortcoming concerns. Respondents specifically mentioned high turnover rates within early childhood settings, a lack of sufficient staffing and professional

development to support individual student needs, and a lack of teacher buy-in to program improvement efforts as shortcomings to current screening and instructional practices.

It is clear that respondents in this study recognized early screening as an important guide to instructional decision-making and learning difficulty prevention; however, they also perceived that preschool teachers lack knowledge and skill around early screening of student skillsets and functioning to inform their instruction. Here, it is once again important to note that greater than 95% of survey respondents responding to the selected response items associated with preschool teacher knowledge and skill were individuals serving in a preschool services role, thus these findings are almost exclusively preschool respondents judging their own and their colleagues' capacity. While survey respondents were generally neutral regarding preschool educators' knowledge of their students' emergent literacy and math skills, respondents were more likely to disagree that preschool teachers have knowledge of their students' behavioral and cognitive functioning. Interestingly, administrators/coordinators were generally more optimistic in their appraisal of preschool teachers' knowledge in these areas as compared to educators/specialists who presumably work with children routinely and closely. Respondents in even greater numbers perceived that preschool teachers lack the necessary skills to collect and use these assessment data to evaluate learning difficulty risk and to support student instructional needs. Perhaps most conspicuous was that the general perception of preschool teachers' lack of skill at *using assessment data to assess risk and inform instructional practices* was observed across all subgroups in the sample (i.e., individuals serving in a preschool role, and preschool-kindergarten educators/specialists and administrators/coordinators).

Conversely, respondents were either neutral toward or in agreement that kindergarten teachers had adequate knowledge of these same student skillsets, and that kindergarten teachers

had the needed skills to collect and use such data to assess learning risk and inform their instruction. Once again, the respondents to the selected response items associated with kindergarten teacher knowledge and skill were largely serving in preschool services roles; however, each of the seven kindergarten professionals also responded to these item prompts using the five-point ordinal scale. Respondents generally perceived kindergarten educators' as having knowledge of their students' emergent literacy, mathematics, and behavioral skills, and that kindergarten teachers were skilled at using student assessment results to assess student, but were more neutral about kindergarten teachers' skills at assessing learning risk based on students' emergent literacy and math skills, behavior, and cognitive functioning.

Respondents' perceptions that preschool teachers generally have less knowledge and skill around early screening and its use to inform their practice compared to that of kindergarten teachers points to a perceived discrepancy between preschool and kindergarten settings regarding: (a) teachers' access to relevant student data, (b) their ability to assess students' academic skills, aspects of behavior, and cognitive functioning, and (c) their capacity to use these student data to assess risk and provide targeted instructional support. It is possible that our findings relate to a focus on a broad range of student developmental skillsets and a relative lack of resources and support around data-based decision making and instructional practices in preschools that has been observed by some researchers in preschool learning contexts (e.g., Cunningham et al., 2009; Early et al., 2007; Greenwood et al., 2012)—support and resources that have been more commonly available in kindergarten settings (O'Connor & Freeman, 2012; U.S. Department of Education, 2009). This discrepancy in respondents' perceptions perhaps points to a need for greater alignment of strategies and resources across the transition from preschool into kindergarten advocated by Reynolds et al. (2010) and the necessity to provide additional

resources to preschool teachers around student data collection/use to identify and support students at risk of learning difficulties such as Barnett and Carolan (2013) urged. Along these lines, and in conjunction with implementing any early screening tool as part of Project ICEBERG, improved support for preschool teachers in terms of student data collection and use might be important to address the apparent discrepancy in early learning stakeholder thinking and practice found in our survey—that early screening data collection is important, though seldom (or possibly inadequately) used when it comes to actual preschool learning risk assessment and instructional decision-making.

Efforts to provide preschool teachers with access to student data and associated professional support on its use will likely be more effective and sustainable if teachers find support resources readily available and pertinent (Menzies et al., 2008; Roehrig et al., 2008), and if shortcomings in current practice are identified and contextual obstacles can be overcome. Involving teachers in the development of any system of support would likely help identify key shortcomings and potential barriers to successful implementation across preschool and kindergarten learning contexts (Greenwood, 1999).

One potential solution to the discrepancy between the perceived importance of early screening information and the actual collection and effective use of such data, as well as the perceived obstacles to implementing associated teacher supports, is the use of an online tablet-based system through which teachers could access and use student data to screen for and assess learning risk and inform individualized instruction. A primary goal of our survey was to assess the opinions of preschool and kindergarten stakeholders regarding the value of such a tablet-based system in these learning contexts. Overall, respondents were cautiously optimistic about the prospect of a tablet-based student assessment and data management resource, with over half

of respondents reporting that a tablet-based system would be a beneficial addition to the preschool and kindergarten environments, and an additional fifth of participants noting that a tablet would be useful under certain circumstances. Many respondents, particularly those working in preschool learning settings, referred to the practicality of a tablet-based system, in that it would allow teachers to have quick and easy access to student data and performance graphs and provide teachers with an efficient method of collecting student data over time in order to monitor progress toward identified learning goals and behavioral targets. Respondents also noted that a tablet-based system would address shortcomings in current practices, as indicated by comments that with appropriate support and professional development, such a system would allow teachers to more easily use student data to plan lessons and individualize instruction and interventions to support specific learning needs.

In determining the feasibility of designing and implementing a tablet-based system as a means to collect student data, assess learning risk, and guide instructional decision making, it is critical to ensure that preschool and kindergarten teachers are adequately equipped with the actual technology and the skillsets required to appropriately use it. Survey respondents indicated a wide range of access to tablet devices and proficiency in their use for both preschool and kindergarten teachers. Further, while many respondents expressed enthusiasm about the introduction of a tablet-based system into preschool and kindergarten settings, approximately half of participants either felt that the benefit of a tablet depended on how it was utilized in the classroom, or indicated that they were unsure of whether a tablet would be beneficial to their instructional practices. For example, several respondents expressed concerns that the tablet would be too distracting for students in preschool settings, while two others thought that a tablet-based system may require extensive and arduous teacher training—notions, in part, backed by

research findings in other preschool and K-12 learning contexts (Abbott et al., 2006; Bebell et al., 2004; Buzhardt et al., 2010; Connor et al., 2007; Greenwood et al., 2011). Clearly, respondents to our survey expressed varied opinions regarding the cost-benefit of a tablet-based system designed to improve teachers' data-based decision-making. Thus, in planning for implementation and integration of a tablet-based system within preschool and kindergarten learning settings, it is essential for us to take into account the different types and ongoing nature of the assessment and instructional support that will likely be needed to meet the needs of both teachers and their students (Early et al., 2007) and the contextual factors that might hinder implementation and sustainable integration of any such technology tool (Hew & Brush, 2007).

Limitations

Findings from the IN Survey provide insights into preschool and kindergarten teachers' knowledge and use of early screening data as a basis for identifying student learning risk and informing instructional decision-making, and the potential implementation of a tablet-based tool to aid in this process in preschool and kindergarten learning contexts. However, a number of limitations must be considered. Perhaps the most notable limitation is that we recruited a sample of convenience, using a nonprobability approach, which substantially reduces our ability to generalize our findings to the broader population of early learning professionals (Alonzo & Tindal, 2011). Our pool of respondents very likely does not represent Oregon preschool and kindergarten stakeholders as a whole, (i.e., educators, specialists, administrators, and coordinators), the primary population from which we were attempting to glean insights. We recruited preschool and kindergarten respondents largely through existing professional relationships, having our colleagues recruit additional respondents through their own

professional circles. It is quite probable that our respondents' views differ from those in the more general stakeholder population, and that our results are biased to some extent.

Likely further limiting the generalizability of our findings is the small sample size, especially in terms of kindergarten professionals. Only 50 individuals completed the IN Survey, of whom 40 served in a preschool related role and seven in a professional role related to kindergarten. Additionally, only 13 preschool teachers were included in the sample, and only four kindergarten teachers—far less than 1% of the total preschool/kindergarten teacher population in Oregon (Teacher Certification Degrees, 2015). Additionally, a substantial number of respondents replied "*Insufficient Experience to Respond*" to selected response items (between 12% and 18% for preschool item prompts, and between 28% and 40% for kindergarten item prompts), which further limited the number of analyzable responses to these items and the insights we could garner. Thus, conclusions about the opinions of members of the Oregon early learning field on matters of access and use of students' screening data to inform instructional decision making in preschool and kindergarten learning environments are somewhat tenuous.

Conclusions

Our primary goal for Project ICEBERG is to develop strategies and resources to support preschool and kindergarten teachers' instructional decisions and reduce children's risk for developing learning difficulties. The IN Survey administered to Oregon early learning and kindergarten stakeholders in fall 2015 was designed to get a sense of professionals' perceptions about how a tablet-based tool might aid in supporting teachers' data-based decision making, including identifying needs around successful implementation and integration of such a tool across the preschool-kindergarten transition. Whereas respondents overall expressed that early screening data was an important basis for instructional decision-making, perceptions of teachers'

access to and use of such data to assess learning risk and inform instruction varied more substantially, with greater confidence found for kindergarten than preschool practices. Respondents also noted a need for greater resources and professional guidance regarding data-based instructional decision making, in general, and connectively in terms of implementing a tablet-based tool designed to assist in these types of classroom practices. It is apparent that successful implementation and integration of any tablet-based early screening tool as part of Project ICEBERG will require that researchers heed contextual factors present across different preschool and kindergarten learning environments that might help or hinder the process. Surveying early learning and kindergarten professionals to glean a deeper sense of their perceptions, knowledge and skills will be an important and ongoing part of Project ICEBERG.

References

Abbott, M., Greenwood, C. R., Buzhardt, J., & Tapia, Y. (2006). Using technology-based teacher support tools to scale up the classwide peer tutoring program. *Reading & Writing Quarterly, 22*(1), 47–64. doi:10.1080/10573560500203525

Alonzo, J., & Tindal, G. (2011). *Instrument and survey analysis technical report: Program implementation survey (Technical Report No. 1112)*. Retrieved from Eugene, OR:

Barnett, W. S., & Carolan, M. E. (2013). *Trends in state funded preschool programs: Survey findings from 2001-2002 to 2011-2012*. Retrieved from Rutgers–New Brunswick, NJ:

Barnett, W. S., Riley-Ayers, S., & Francis, J. (2015). *Measuring child outcomes in the early years (CEELO Policy Brief)*. Retrieved from New Brunswick, NJ:

Bebell, D., Russell, M., & O'Dwyer, L. (2004). Measuring teachers' technology uses: Why multiple-measures are more revealing. *Journal of Research on Technology in Education, 37*(1), 45-63.

Buzhardt, J., Greenwood, C. R., Walker, D., Carta, J., Terry, B., & Garrett, M. (2010). A web-based tool to support data-based early intervention decision making. *Topics in Early Childhood Special Education, 29*, 201–213. doi:10.1177/0271121409353350

Capizzi, A. M., & Fuchs, L. S. (2005). Effects of curriculum based measurement with and without diagnostic feedback on teacher planning. *Remedial and Special Education, 26*, 159-174. doi:10.1177/07419325050260030401

Connor, C. M., Morrison, F. J., Fishman, B. J., Schatschneider, C., & Underwood, P. (2007). Algorithm-guided individualized reading instruction. *Science, 315*, 464-465. doi:10.1126/science.1134513

Cunningham, A. E., Zibulsky, J., & Callahan, M. D. (2009). Starting small: Building preschool teacher knowledge that supports early literacy development. *Reading and Writing, 22*, 487-510. doi:10.1007/s11145-009-9164-z

Early, D. M., Maxwell, K. L., Burchinal, M., Alva, S., Bender, R. H., Bryant, D., . . . Zill, N. (2007). Teachers' education, classroom quality, and young children's academic skills: Results from seven studies of preschool programs. *Child Development, 78*, 558-580. doi:10.1111/j.1467-8624.2007.01014.x

Fuchs, D., & Fuchs, L. S. (2001). Responsiveness-to-intervention: A blueprint for practitioners, policymakers, and parents. *Teaching Exceptional Children, 38*(1), 57-61.

Fuchs, D., & Fuchs, L. S. (2006). Introduction to response to intervention: What, why and how valid is it? *Reading Research Quarterly, 41*, 93-99. doi:10.1598/RRQ.41.1.4

Fuchs, D., Fuchs, L. S., McMaster, K. N., & Otaiba, S. A. (2003). Identifying children at risk for reading failure: Curriculum-based measurement and the dual-discrepancy approach. In H. L. Swanson & K. R. Harris (Eds.), *Handbook of learning disabilities* (pp. 431–449). New York, NY: Guilford Press.

Greenwood, C. R. (1999). Reflections on a research career: Perspective on 35 years of research at the Juniper Gardens Children's Project. *Exceptional Children, 66*(1), 7-21. doi:10.1177/001440299906600101

Greenwood, C. R., Carta, J., & McConnell, S. (2011). Advances in measurement for universal screening and individual progress monitoring of young children. *Journal of Early Intervention, 33*(4), 254-267. doi:10.1177/1053815111428467

Greenwood, C. R., Carta, J. J., Atwater, J., Goldstein, H., Kaminski, R., & McConnell, S. (2012). Is a Response to Intervention (RTI) approach to preschool language and early literacy

instruction needed? *Topics in Early Childhood Special Education, 33*(1), 48-64. doi:10.1177/0271121412455438

Hew, K. F., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technology Research and Development, 55*(3), 224-252. doi:10.1007/s11423-006-9022-5

IBM Corp. (Released 2015). IBM SPSS Statistics for Macintosh, Version 23.0. Armonk, NY: IBM Corp.

Kowalski, K., Pretti-Frontczak, K., & Johnson, L. (2001). Preschool teachers' beliefs concerning the importance of various developmental skills and abilities. *Journal of Research in Childhood Education, 16*(1), 5-14.

Menzies, H. M., Mahdavi, J. N., & Lewis, J. L. (2008). Early intervention in reading: From research to practice. *Remedial and Special Education, 29*, 67-77. doi:10.1177/0741932508315844

National Association for the Education of Young Children. (2009). *Developmentally appropriate practice in early childhood programs serving children from birth through age 8: A position statement*. Retrieved from Washington, DC:

National Institute for Early Education Research. (2010). *The state of preschool 2010: State preschool yearbook (Appendix C)*. Retrieved from Rutgers–New Brunswick, NJ:

National Institute for Literacy. (2008). *Developing early literacy: Report of the National Early Literacy Panel (A scientific synthesis of early literacy development and implications for intervention)*. Retrieved from Washington, DC:

O'Connor, E. P., & Freeman, E. W. (2012). District-level considerations in supporting and sustaining RTI implementation. *Psychology in the Schools, 49*, 297- 310. doi:10.1002/pits.21598

Reynolds, A. J., Magnuson, K. A., & Ou, S. (2010). Preschool-to-third grade programs and practices: A review of research. *Children and Youth Services Review, 32*, 1121–1131.

Roehrig, A. D., Duggar, S. W., Moats, L., Glover, M., & Mincey, B. (2008). When teachers work to use progress monitoring data to inform literacy instruction: Identifying potential supports and challenges. *Remedial and Special Education, 29*, 364-382. doi:10.1177/0741932507314021

Schulting, A. B., Malone, P. S., & Dodge, K. A. (2005). The effect of school-based kindergarten transition policies and practices on child academic outcomes. *Developmental Psychology, 41*, 860-871.

Teacher Certification Degrees. (2015). The Oregon teaching and certification resource: Oregon teacher salary and jobs. Retrieved from http://www.teachercertificationdegrees.com/certification/oregon/

Tindal, G. (2013). Curriculum-based measurement: A brief history of nearly everything from the 1970s to the present. *ISRN Education (International Scholarly Research Network), 29*. doi:10.1155/2013/958530

U.S. Department of Education. (2009). *Implementing data-Informed decision making in schools: Teacher access, supports and use*. Retrieved from Washington, DC:

Table 1

Frequency Counts and Percentages of Respondent Roles for SQ1.

Role	Respondents	Percent (%)
Building Administrator	2	4
Administrator (Other)	16	32
Kindergarten Educator	4	8
Preschool Educator	13	26
Parent	1	2
Total	50	100

Note. SQ1 – *Select the option that best defines your role in relation to preschool / kindergarten* services – selected response item, all respondents. Fourteen respondents (28%) selected 'Other', and typically detailed their professional role in SQ2 (see Table 2).

Table 2

Frequency Counts and Percentages of Disaggregated Respondent Roles for SQ2.

Role	Respondents	Percent (%)
Building Administrator[^^] (A)	2	4
Director[^^] (A)	5	10
ECSE/Early Learning Hub Coordinator[^^] (C)	6	12
Early Intervention Specialist[^^] (S)	6	12
Manager/Supervisor[^^] (A)	5	10
Preschool Educator[^^] (E)	13	26
Speech/Language Pathologist[++] (S)	5	10
Assistive Technology Specialist[**] (S)	1	2
Dyslexia Specialist[**] (S)	1	2
Kindergarten Educator[**] (E)	4	8
Title I Coordinator[**] (C)	1	2
Parent	1	2
Total	50	100

Note. SQ2 – *Please describe your role in relation to preschool / kindergarten* services – constructed response item – combined with comments given in SQ1 – all respondents, where: E = Educator; S = Specialist; A = Administrator; and C = Coordinator.
[^^] preschool role = 41 (including two SLP, see [++]).
[++] preschool role = 2; kindergarten role = 1; neither preschool nor kindergarten role = 2.
[**] kindergarten role = 7 (including one SLP, see [++]).

Table 3

Frequency Counts and Percentages of Response Patterns for SQ3.

Area of Importance	Respondents	Percent (%)
Disability Identification and Prevention / Meeting Student Needs	28	56
Important (general statement)	13	26
Kindergarten Entry	4	10
PreK/K-12 Systems Alignment	3	6
No Comment / Unsure	2	4
Total	50	100

Note. SQ3 – *Share your thoughts about the importance of early screening information for preventing learning difficulties* – constructed response item – all respondents.

Table 4

Frequency Counts and Percentages of Response Patterns for SQ4.

Area of Shortcoming	Respondents	Percent (%)
Screening and Eligibility	13	26
Resources and Funding	11	22
Pedagogical Knowledge	10	20
Parental Awareness / Follow-through	8	16
Preschool/K-12 Alignment	3	6
Equitable Preschool Access	3	6
Unsure	2	4
Total	50	100

Note. SQ4 – *Describe shortcomings in current practices related to the prevention of learning difficulties* – constructed response item – all respondents.

Table 5

Frequency Counts and Percentages of Generalized Response Patterns for SQ5.

Beneficial	Respondents	Percent (%)
Beneficial view of tablet-based tool's potential	27	54
Benefit is *contingent* on tablet-based tool's purpose and use	11	22
Unsure if tablet-based tool has potential benefit	12	24
Total	50	100

Note. SQ5 – *How might a tablet-based system (e.g., Android, iPad) designed to bring teachers information about their students' learning, behavioral, and cognitive functioning be of benefit in early learning environment* – constructed response item – all respondents.

Table 6

Frequency Counts and Percentages of Specific Response Patterns for SQ5.

Benefit	Respondents*	Percent (%)**
Practical/Efficient Data Collection, Evaluation and Reporting	18	36
Identifying/Meeting Student Needs	15	30
Communication with Stakeholders	7	14
Nonspecific response	19	38

Note. SQ5 – *How might a tablet-based system (e.g., Android, iPad) designed to bring teachers information about their students' learning, behavioral, and cognitive functioning be of benefit in early learning environment* – constructed response item.
*A total of 31 respondents provided specific reasoning in SQ5. The 19 individuals that gave a nonspecific response provided too little detail to categorize their response to SQ5.
**Listed percentages are based on the number of respondents who cited a particular benefit out of the total number of 50 respondents. Individual respondents can fall into more than one of the specific benefit categories.

Table 7

Frequency Counts and Medians for SQ6 prompts.

Survey Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Insufficient Experience
Preschool teachers have sufficient information about their students' emergent literacy skills.	3	12	***15***	11	2	6
Preschool teachers have sufficient information about their students' emergent math skills.	2	14	***17***	9	1	6
Preschool teachers have sufficient information about what aspects of their students' behavior may impact learning.	4	12	***8***	14	5	6
Preschool teachers have sufficient information about what aspects of their students' cognitive functioning (working memory, executive functioning, etc.) may impact learning.	8	***17***	8	8	2	6
Preschool teachers are skilled in the use of student assessment results to support student instructional needs.	5	***21***	4	10	4	5
Preschool teachers are skilled at assessing learning difficulty risk based on their students' emergent literacy skills.	12	***16***	9	4	2	6
Preschool teachers are skilled at assessing learning difficulty risk based on their students' emergent math skills.	12	***20***	7	2	2	6

Note. SQ6 – *Please respond to each of the following questions related to preschool teachers* – selected-response item – all respondents. Median responses on the 5-point ordinal scale are underlined-bolded-italicized.

Table 7 (continued)

Frequency Counts and Medians for SQ6 prompts.

Survey Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Insufficient Experience
Preschool teachers are skilled at assessing learning difficulty risk based on aspects of their students' behavior that may impact learning.	5	***18***	7	11	2	6
Preschool teachers are skilled at assessing learning difficulty risk based on aspects of their students' cognitive functioning (working memory, executive functioning, etc.) that may impact learning.	9	***21***	6	5	2	6
Preschool teachers generally have access to at least one tablet device (Android, iPad, etc.) for use in their classroom.	10	8	***9***	11	2	9
Preschool teachers generally are skilled at using tablet devices (Android, iPad, etc.).	5	11	***11***	9	5	8

Note. SQ6 – *Please respond to each of the following questions related to preschool teachers* – selected-response item – all respondents. Median responses on the 5-point ordinal scale are underlined-bolded-italicized.

Table 8

Frequency Counts and Medians for SQ7 prompts.

Survey Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Insufficient Experience
Kindergarten teachers have sufficient information about their students' emergent literacy skills.	-	4	6	***17***	4	15
Kindergarten teachers have sufficient information about their students' emergent math skills.	-	4	6	***17***	4	15
Kindergarten teachers have sufficient information about what aspects of their students' behavior may impact learning.	-	8	***8***	13	2	15
Kindergarten teachers have sufficient information about what aspects of their students' cognitive functioning (working memory, executive functioning, etc.) may impact learning.	-	12	***9***	9	1	15
Kindergarten teachers are skilled in the use of student assessment results to support student instructional needs.	-	3	8	***16***	4	15
Kindergarten teachers are skilled at assessing learning difficulty risk based on their students' emergent literacy skills.	1	***6***	12	10	2	15
Kindergarten teachers are skilled at assessing learning difficulty risk based on their students' emergent math skills.	1	***6***	12	10	2	15

Note. SQ7 – *Please respond to each of the following questions related to kindergarten teachers* – selected-response item – all respondents. Median responses on the 5-point ordinal scale are underlined-bolded-italicized.

Table 8 (continued)

Frequency Counts and Medians for SQ7 prompts.

Survey Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Insufficient Experience
Kindergarten teachers are skilled at assessing learning difficulty risk based on aspects of their students' behavior that may impact learning.	2	***8***	9	11	1	15
Kindergarten teachers are skilled at assessing learning difficulty risk based on aspects of their students' cognitive functioning (working memory, executive functioning, etc.) that may impact learning.	2	*7*	13	8	2	14
Kindergarten teachers generally have access to at least one tablet device (Android, iPad, etc.) for use in their classroom.	4	3	*7*	11	1	20
Kindergarten teachers generally are skilled at using tablet devices (Android, iPad, etc.).	2	6	***9***	9	2	18

Note. SQ7 – *Please respond to each of the following questions related to kindergarten teachers* – selected-response item – all respondents. Median responses on the 5-point ordinal scale are underlined-bolded-italicized.

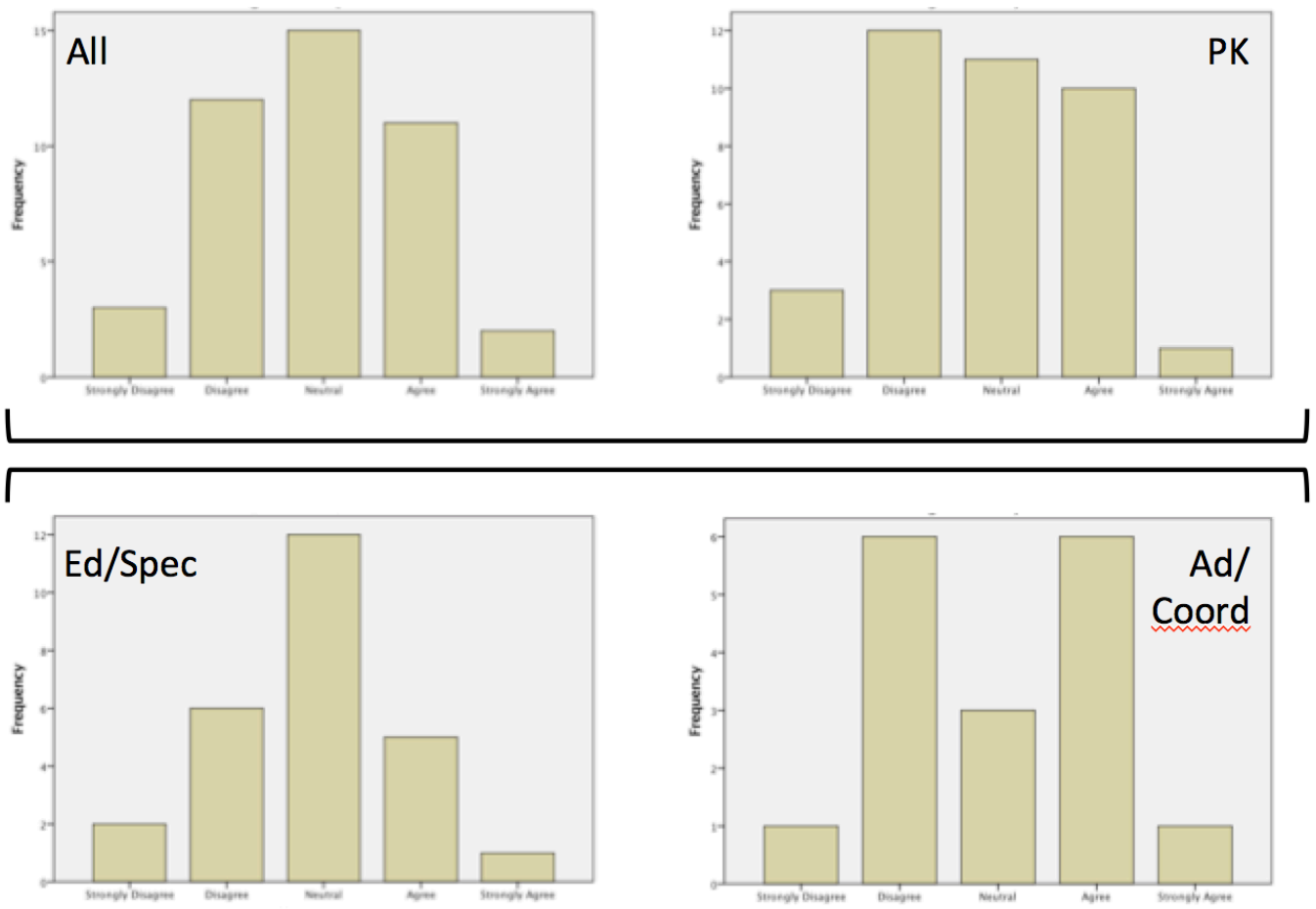


Figure 1. Histograms for *Preschool teachers have sufficient information about their students' emergent literacy skills* (Prompt 1, SQ6) for the entire sample (All) and by subgroup (PK = preschool services role; Ed/Spec = teachers and special educators/specialists; Ad/Coord = administrators and coordinators).

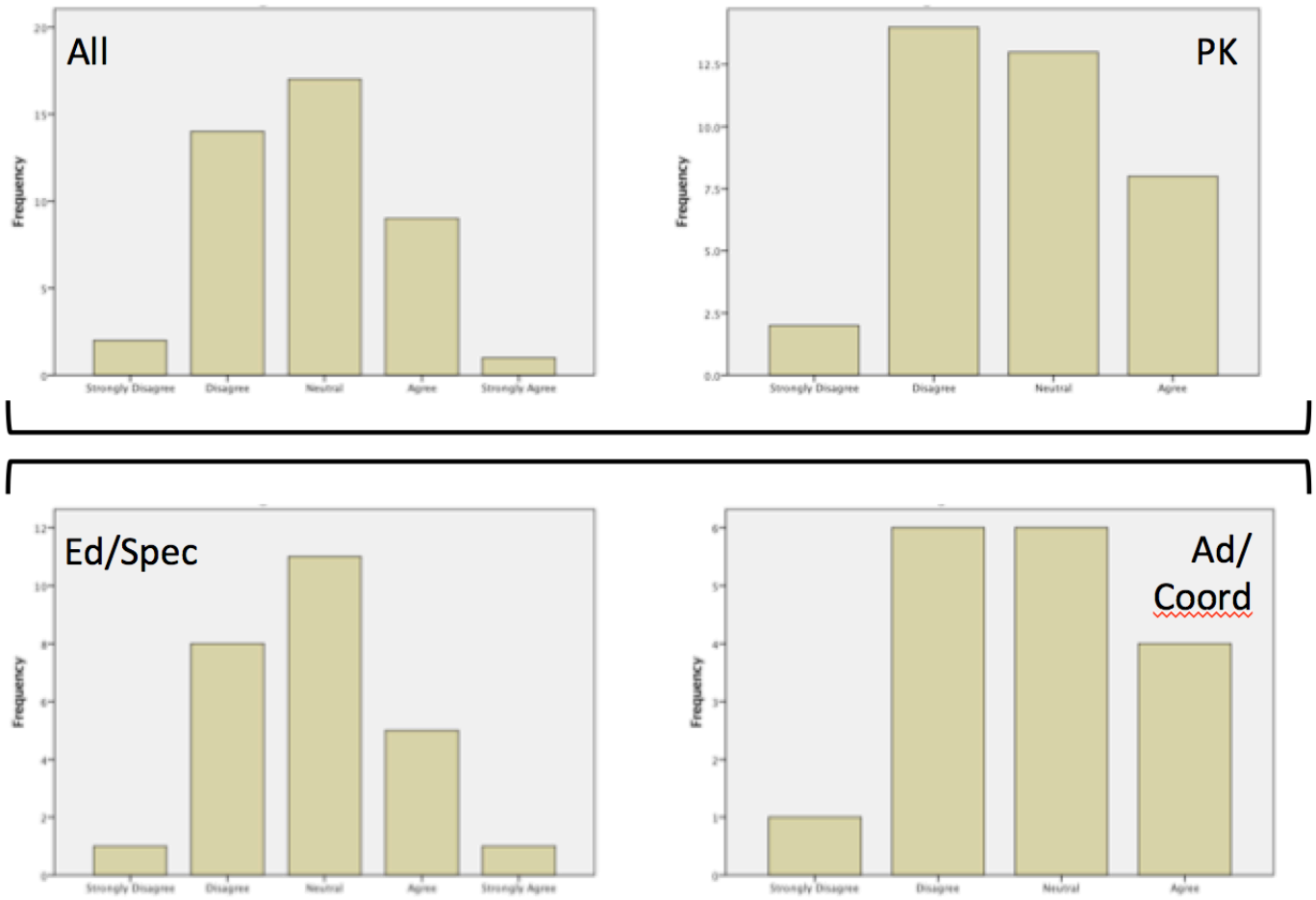


Figure 2. Histograms for *Preschool teachers have sufficient information about their students' emergent math skills* (Prompt 2, SQ6) for the entire sample (All) and by subgroup (PK = preschool services role; Ed/Spec = teachers and special educators/specialists; Ad/Coord = administrators and coordinators).

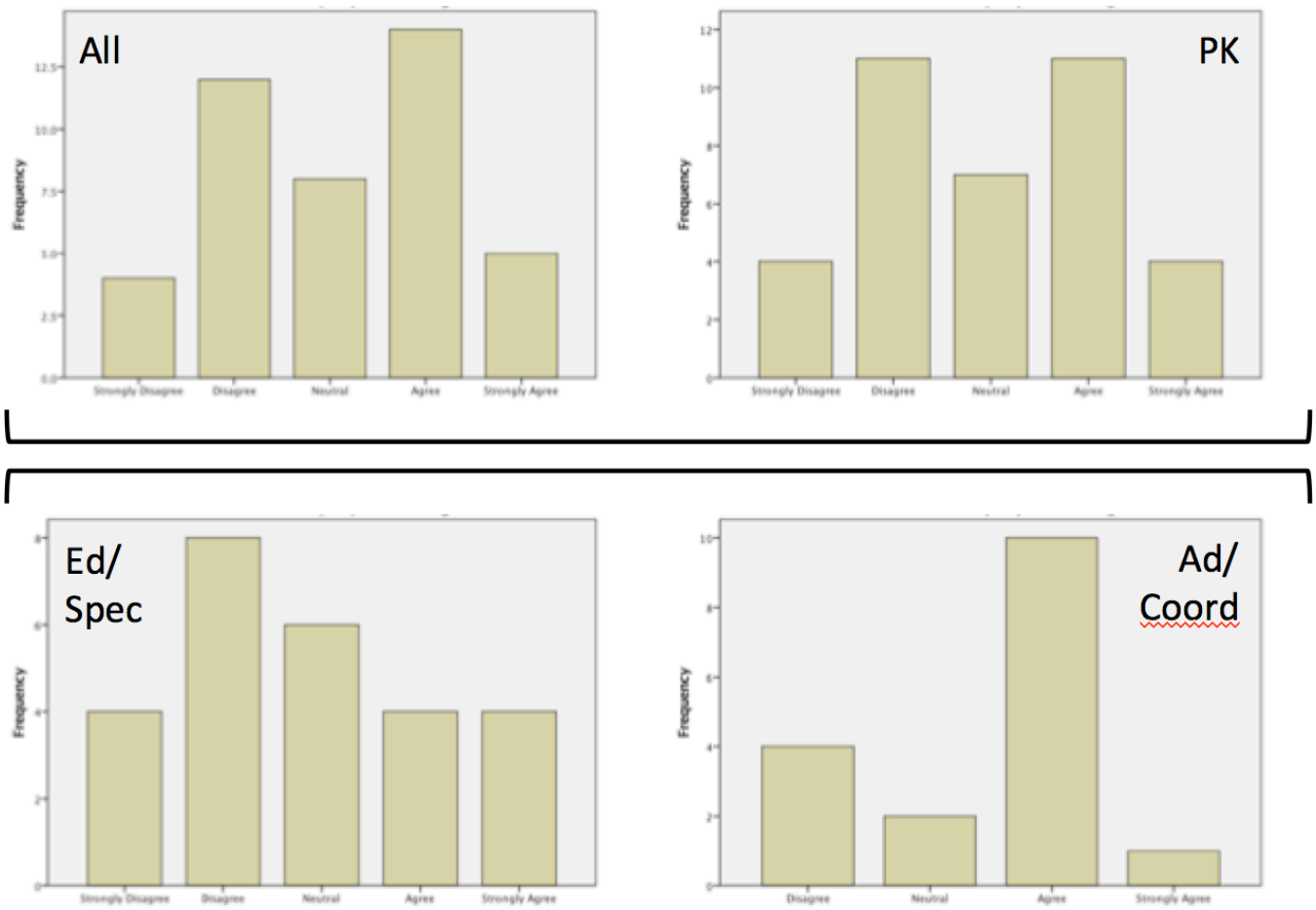


Figure 3. Histograms for *Preschool teachers have sufficient information about what aspects of their students' behavior may impact learning* (Prompt 3, SQ6) for the entire sample (All) and by subgroup (PK = preschool services role; Ed/Spec = teachers and special educators/specialists; Ad/Coord = administrators and coordinators).

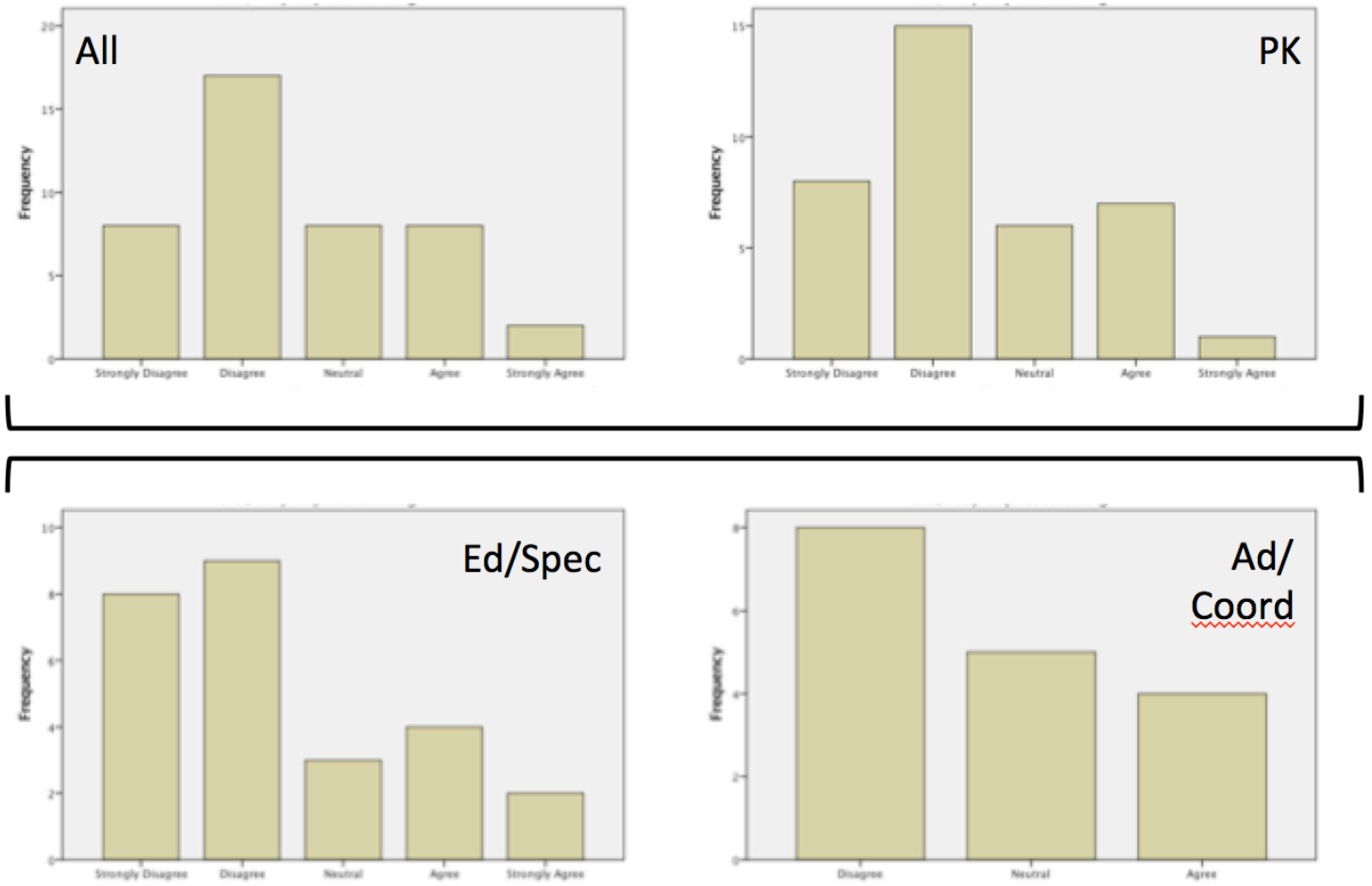


Figure 4. Histograms for *Preschool teachers have sufficient information about what aspects of their students' cognitive functioning (working memory, executive functioning, etc.) may impact learning* (Prompt 4, SQ6) for the entire sample (All) and by subgroup (PK = preschool services role; Ed/Spec = teachers and special educators/specialists; Ad/Coord = administrators and coordinators).

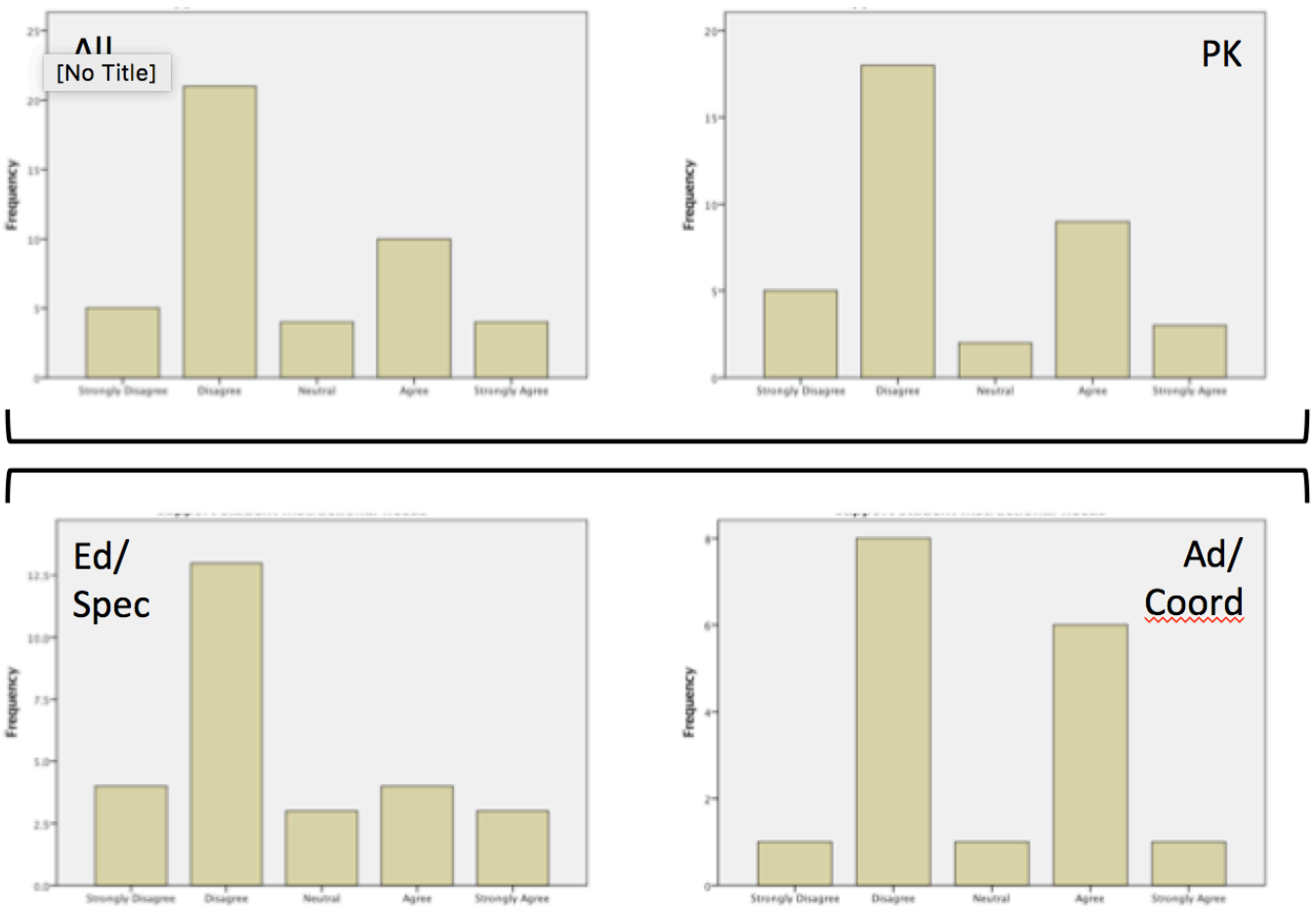


Figure 5. Histograms for *Preschool teachers are skilled in the use of student assessment results to support student instructional needs* (Prompt 5, SQ6) for the entire sample (All) and by subgroup (PK = preschool services role; Ed/Spec = teachers and special educators/specialists; Ad/Coord = administrators and coordinators).

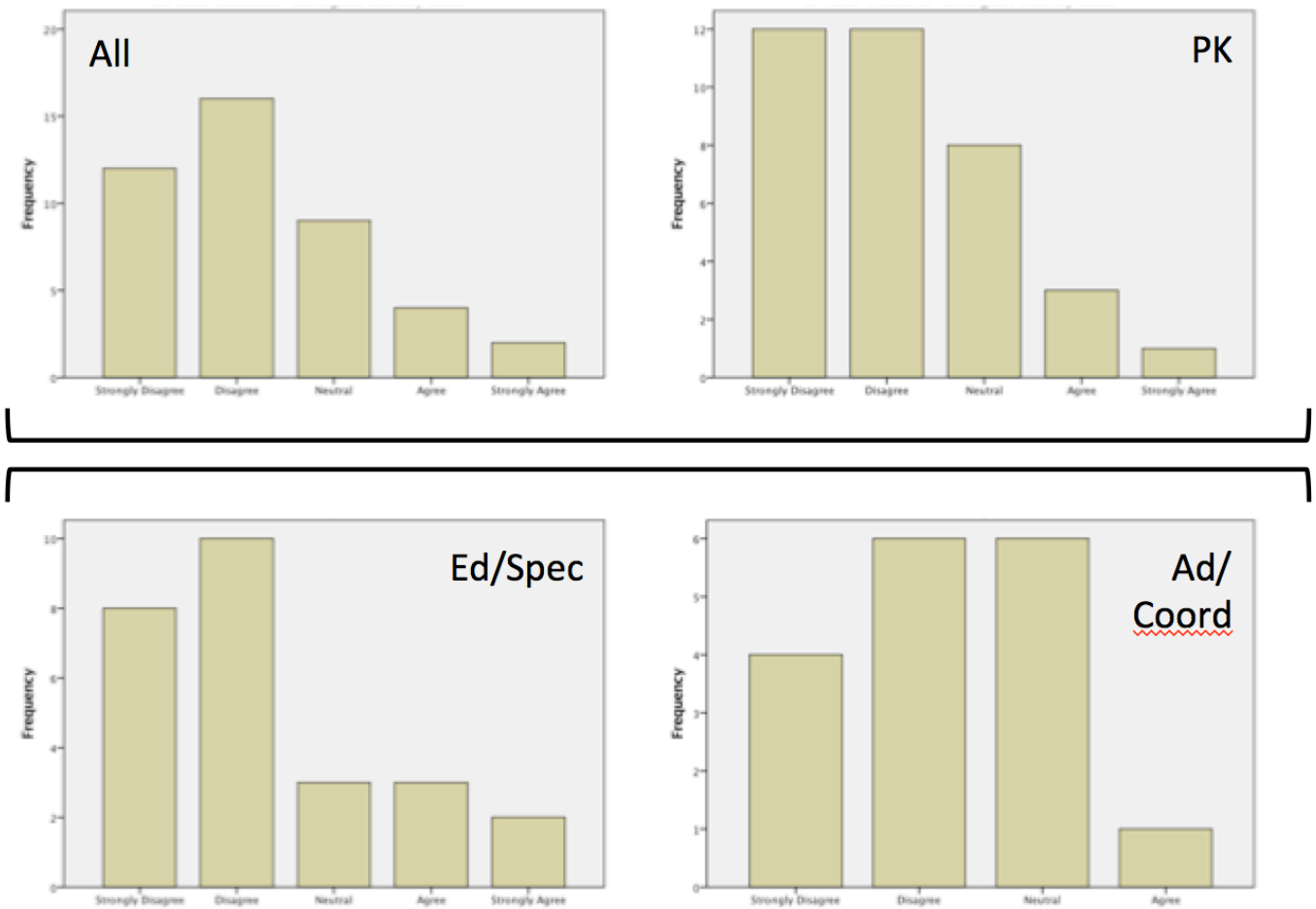


Figure 6. Histograms for *Preschool teachers are skilled at assessing learning difficulty risk based on their students' emergent literacy skills* (Prompt 6, SQ6) for the entire sample (All) and by subgroup (PK = preschool services role; Ed/Spec = teachers and special educators/specialists; Ad/Coord = administrators and coordinators).

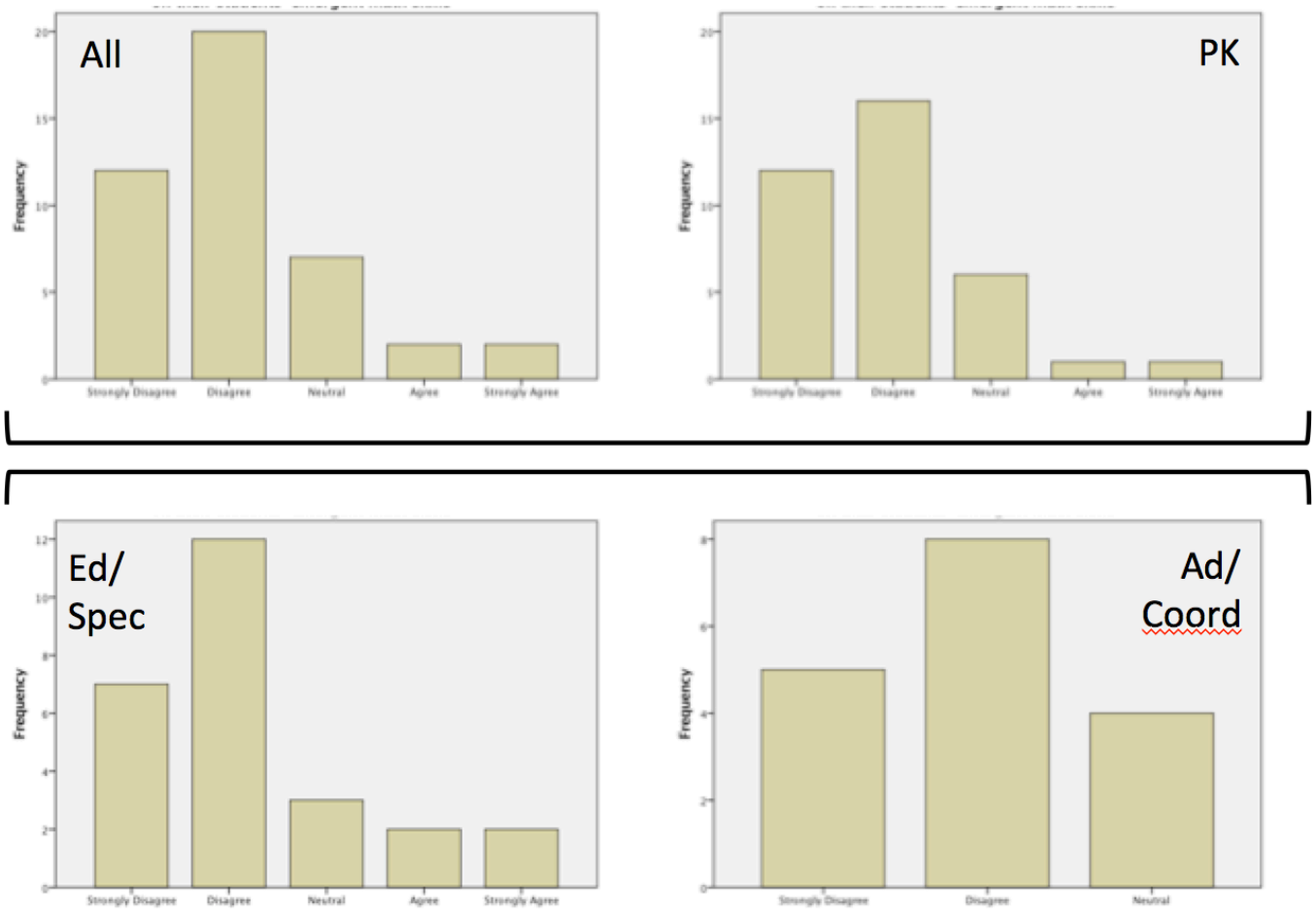


Figure 7. Histograms for *Preschool teachers are skilled at assessing learning difficulty risk based on their students' emergent math skills* (Prompt 7, SQ6) for the entire sample (All) and by subgroup (PK = preschool services role; Ed/Spec = teachers and special educators/specialists; Ad/Coord = administrators and coordinators).

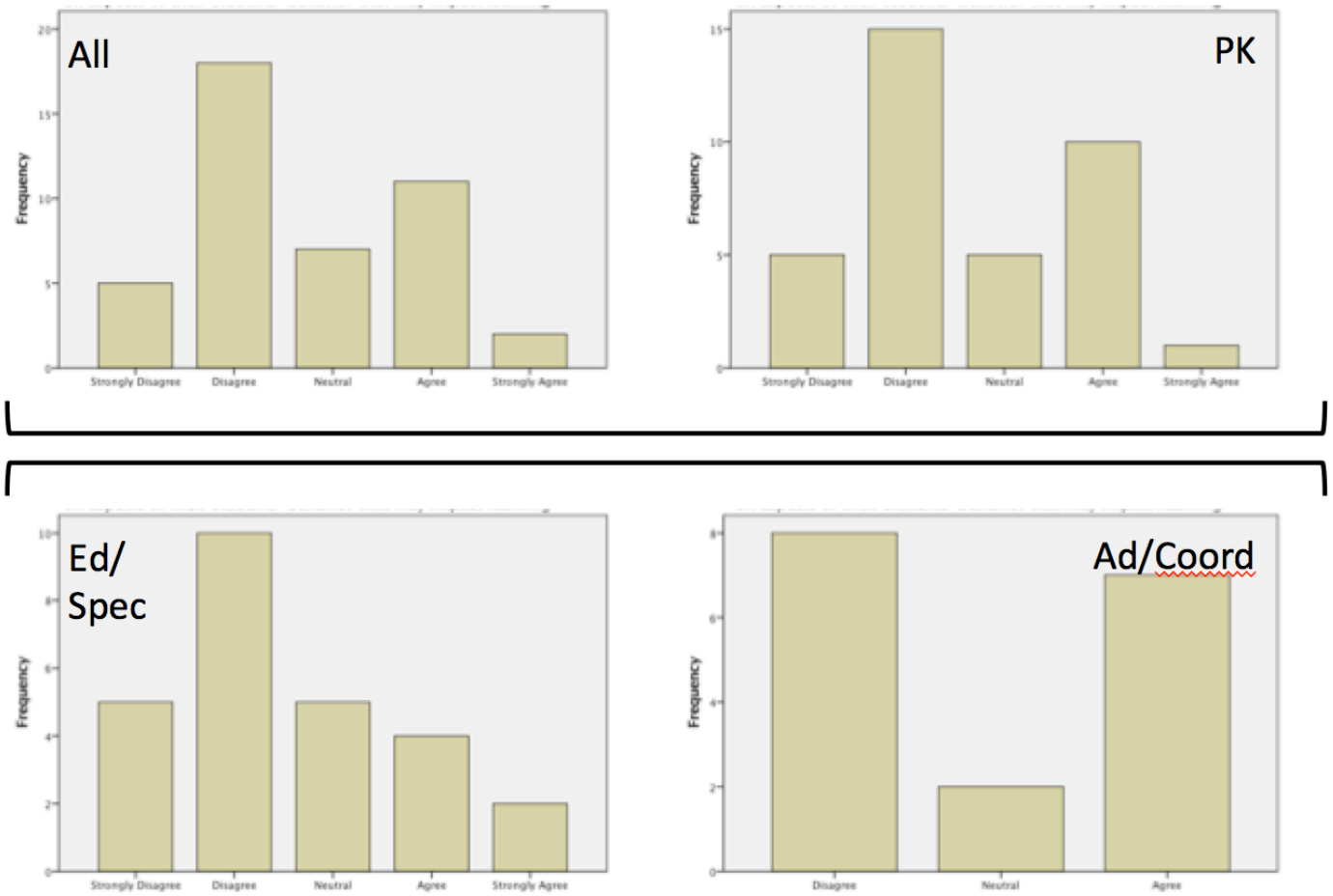


Figure 8. Histograms for *Preschool teachers are skilled at assessing learning difficulty risk based on aspects of their students' behavior that may impact learning* (Prompt 8, SQ6) for the entire sample (All) and by subgroup (PK = preschool services role; Ed/Spec = teachers and special educators/specialists; Ad/Coord = administrators and coordinators).

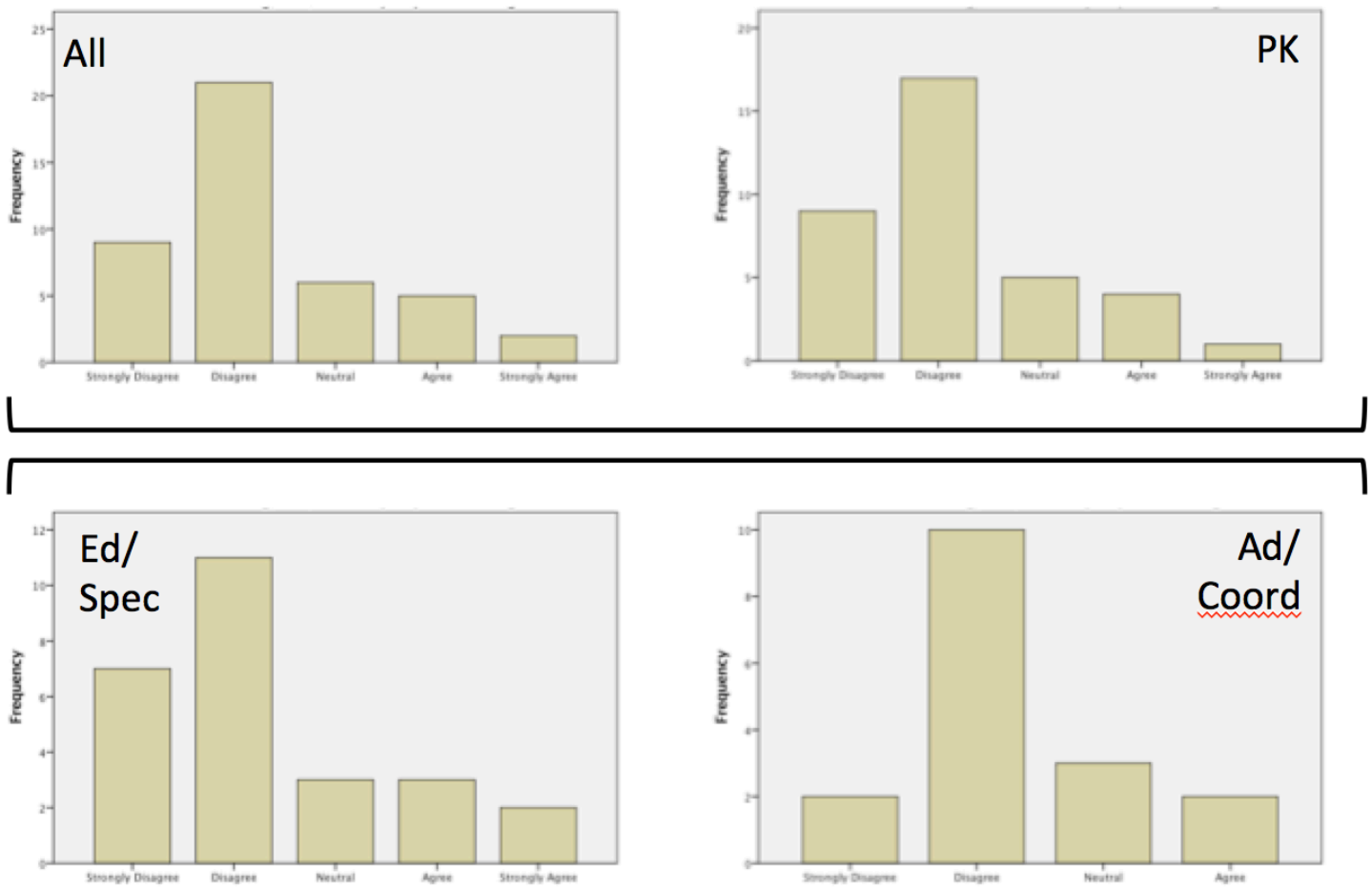


Figure 9. Histograms for *Preschool teachers are skilled at assessing learning difficulty risk based on aspects of their students' cognitive functioning (working memory, executive functioning, etc.) that may impact learning* (Prompt 9, SQ6) for the entire sample (All) and by subgroup (PK = preschool services role; Ed/Spec = teachers and special educators/specialists; Ad/Coord = administrators and coordinators).

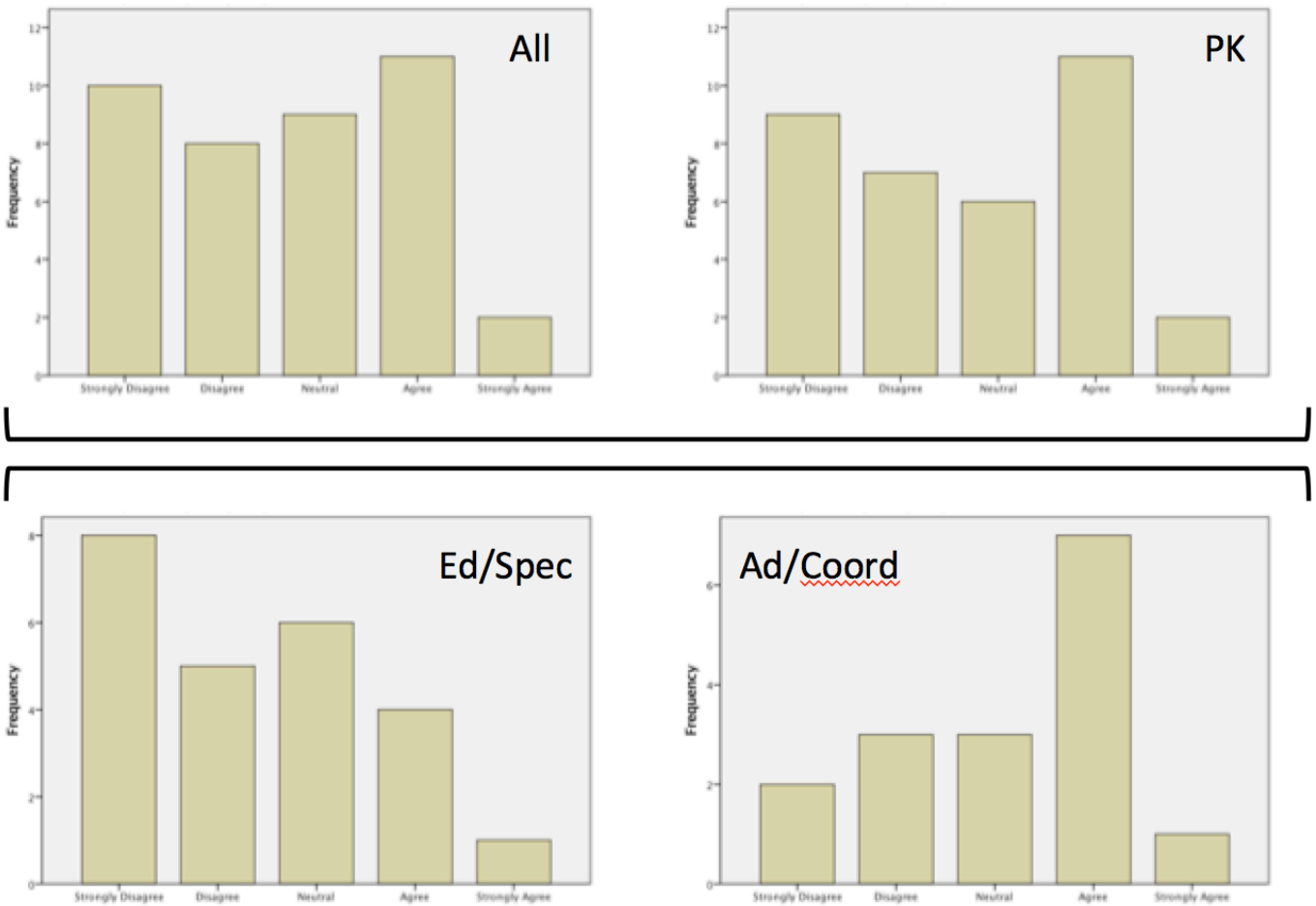


Figure 10. Histograms for *Preschool teachers generally have access to at least one tablet device (Android, iPad, etc.) for use in their classroom* (Prompt 10, SQ6) for the entire sample (All) and by subgroup (PK = preschool services role; Ed/Spec = teachers and special educators/specialists; Ad/Coord = administrators and coordinators).

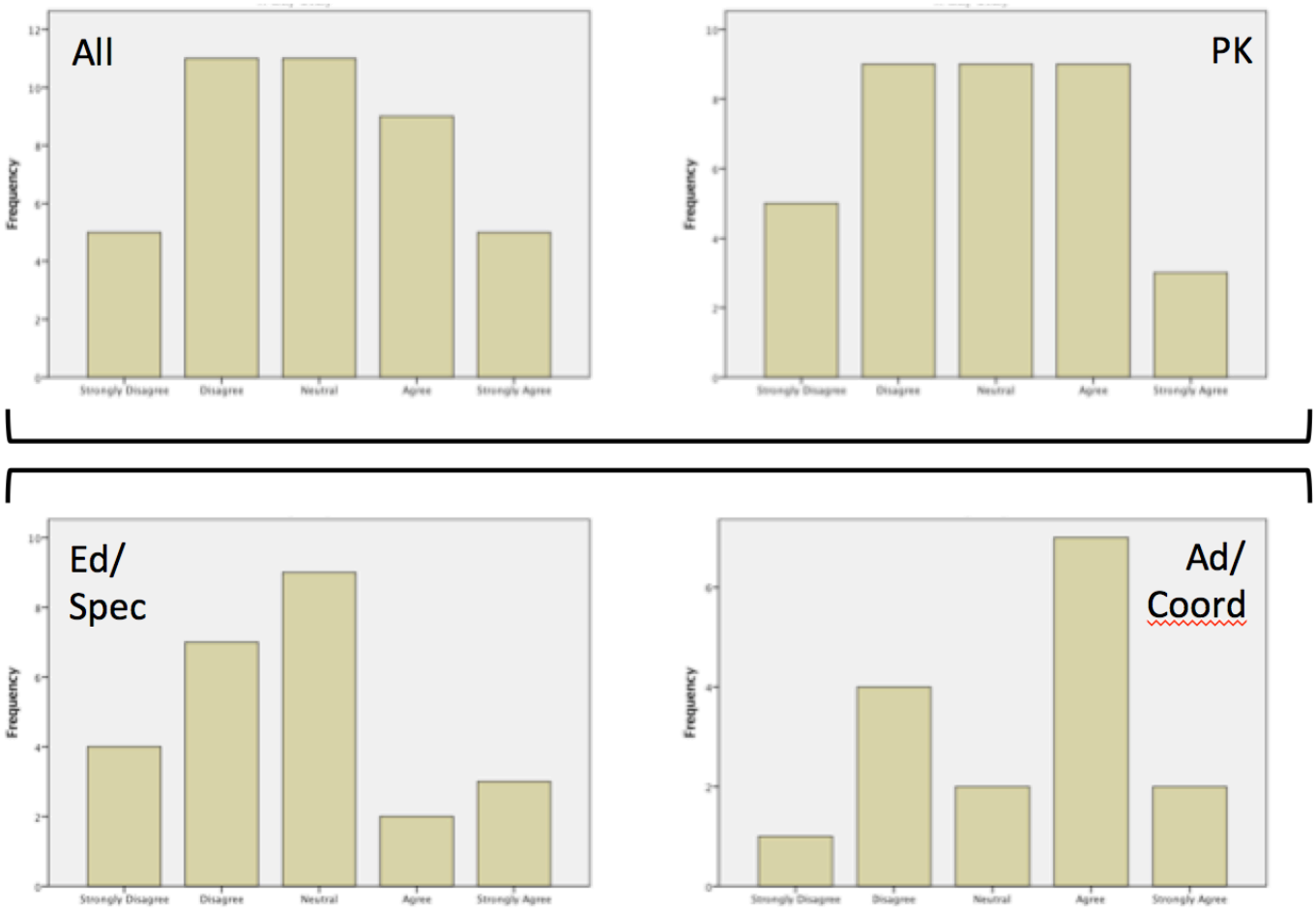


Figure 11. Histograms for *Preschool teachers generally are skilled at using tablet devices* (Prompt 11, SQ6) for the entire sample (All) and by subgroup (PK = preschool services role; Ed/Spec = teachers and special educators/specialists; Ad/Coord = administrators and coordinators).

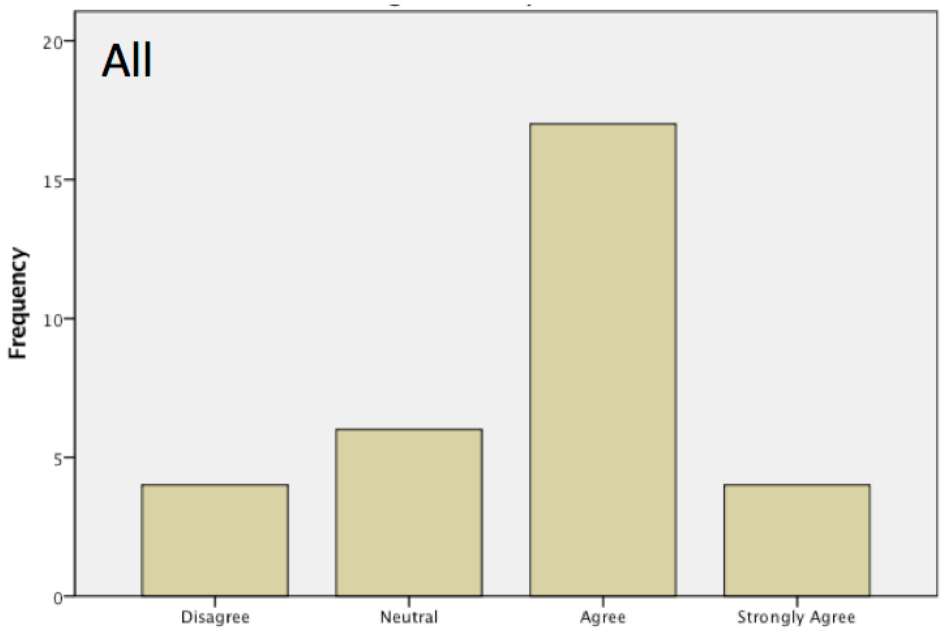


Figure 12. Histogram for *Kindergarten teachers have sufficient information about their students' emergent literacy skills* (Prompt 1, SQ7) for the entire sample (All).

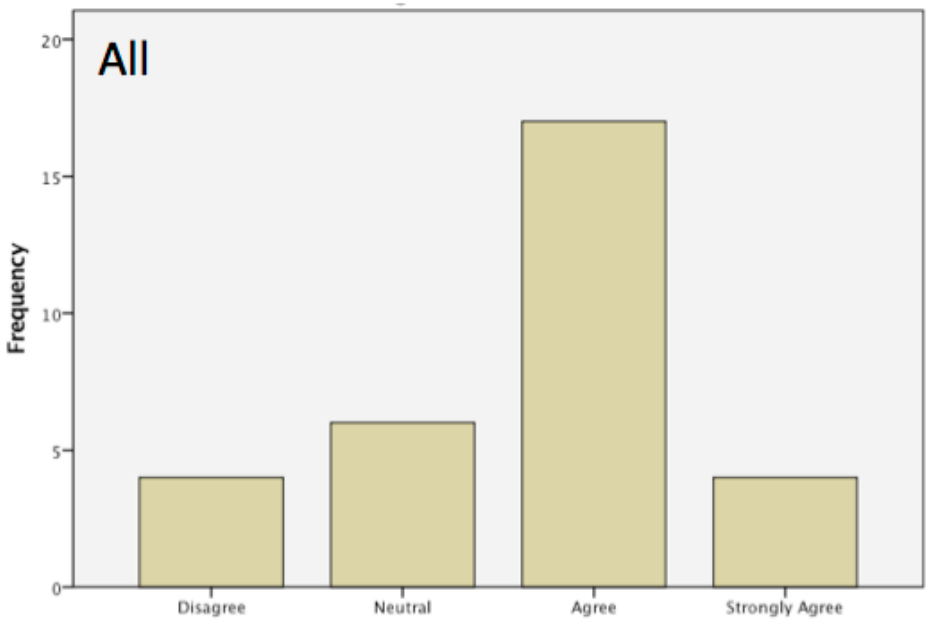


Figure 13. Histogram for *Kindergarten teachers have sufficient information about their students' emergent math skills* (Prompt 2, SQ7) for the entire sample (All).

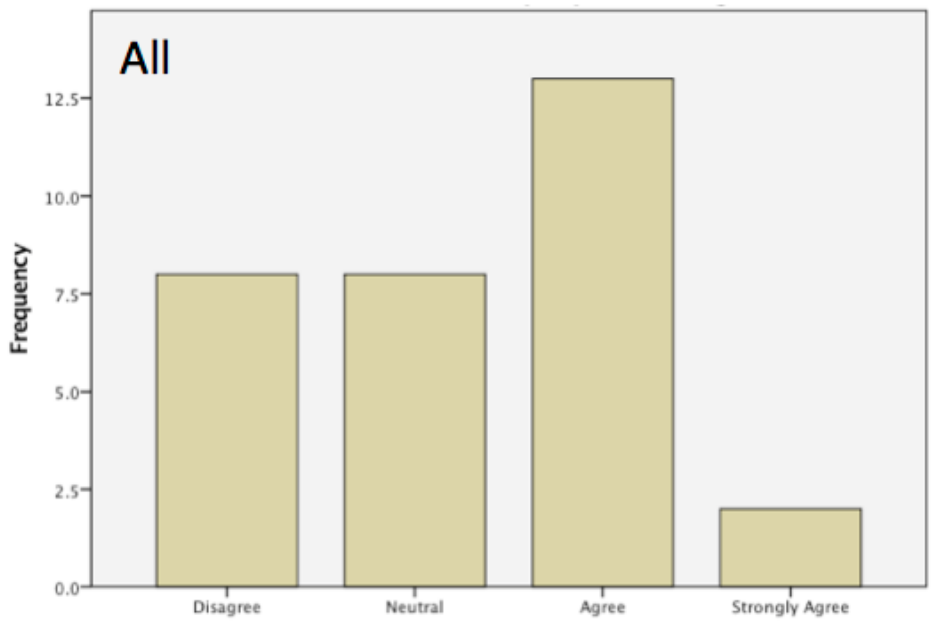


Figure 14. Histogram for *Kindergarten teachers have sufficient information about what aspects of their students' behavior may impact learning* (Prompt 3, SQ7) for the entire sample (All).

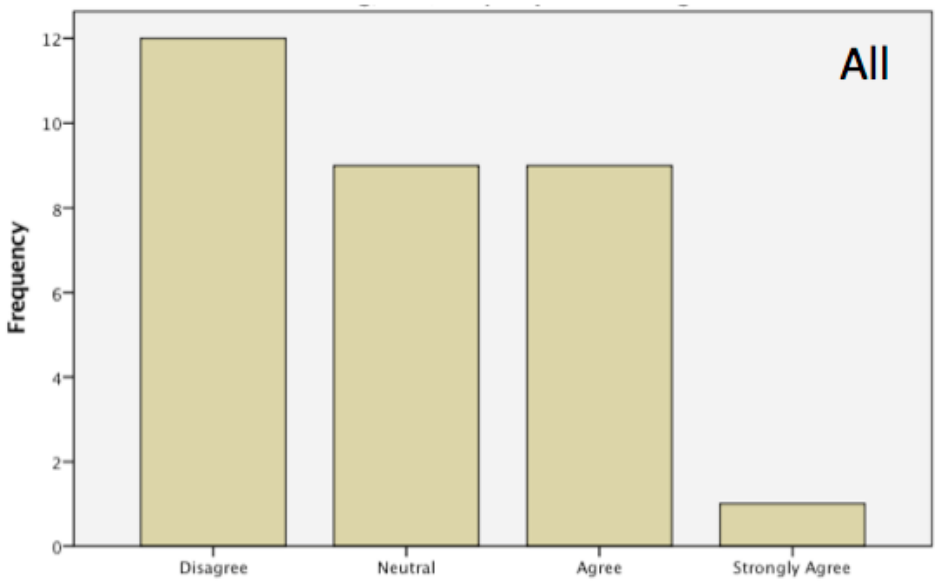


Figure 15. Histogram for *Kindergarten teachers have sufficient information about what aspects of their students' cognitive functioning (working memory, executive functioning, etc.) may impact learning* (Prompt 4, SQ7) for the entire sample (All).

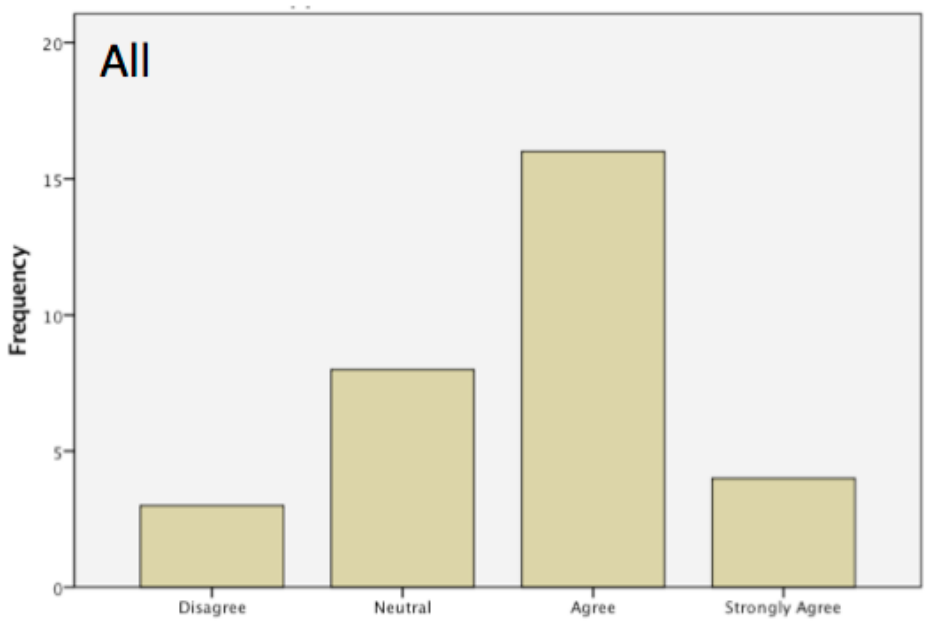


Figure 16. Histogram for *Kindergarten teachers are skilled in the use of student assessment results to support student instructional needs* (Prompt 5, SQ7) for the entire sample (All).

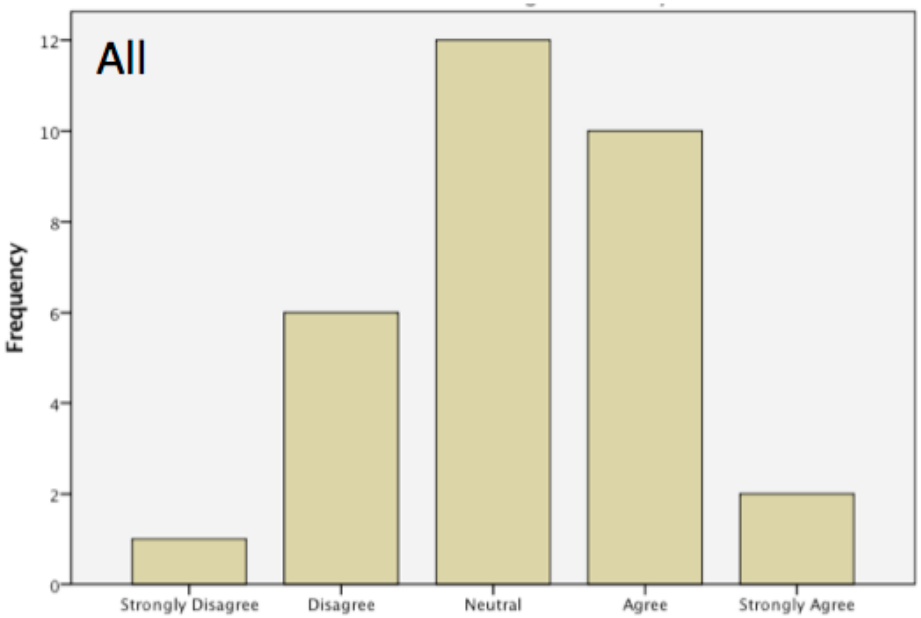


Figure 17. Histogram for *Kindergarten teachers are skilled at assessing learning difficulty risk based on their students' emergent literacy skills* (Prompt 6, SQ7) for the entire sample (All).

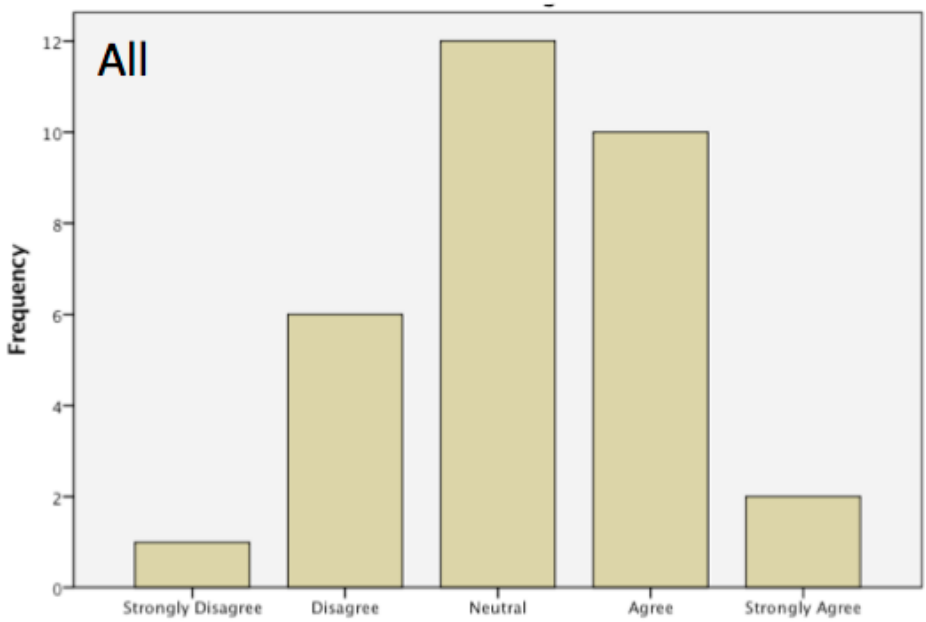


Figure 18. Histogram for *Kindergarten teachers are skilled at assessing learning difficulty risk based on their students' emergent math skills* (Prompt 7, SQ7) for the entire sample (All).

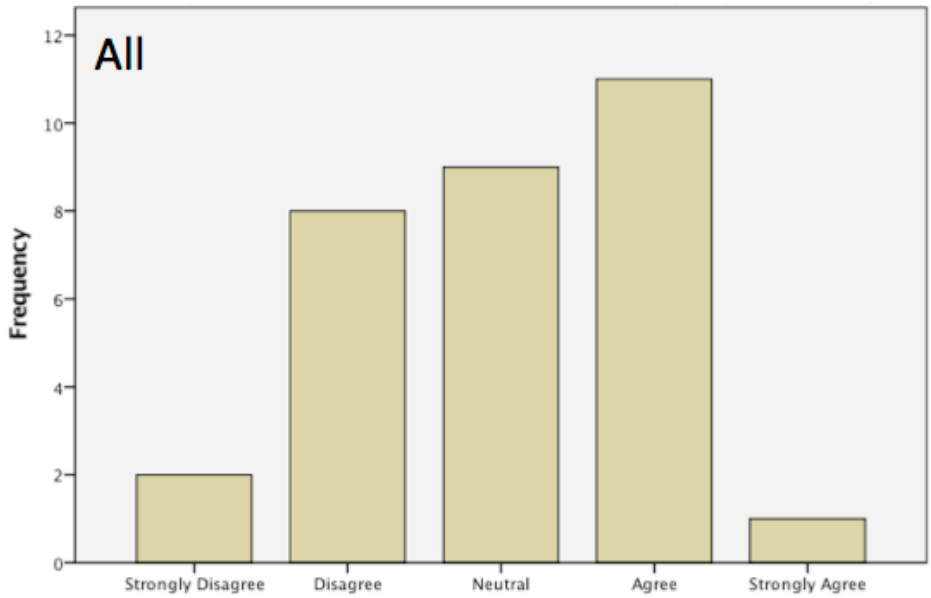


Figure 19. Histogram for *Kindergarten teachers are skilled at assessing learning difficulty risk based on aspects of their students' behavior that may impact learning* (Prompt 8, SQ7) for the entire sample (All).

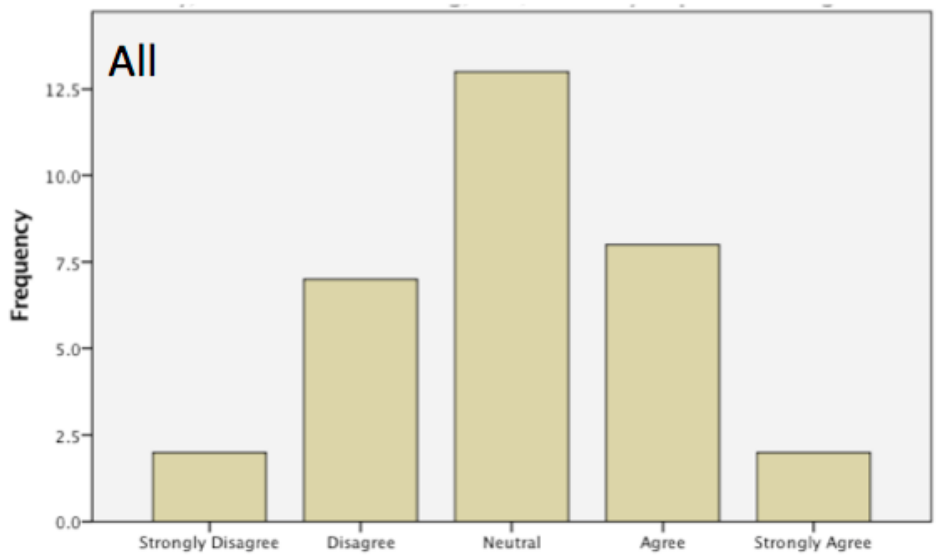


Figure 20. Histogram for *Kindergarten teachers are skilled at assessing learning difficulty risk based on aspects of their students' cognitive functioning (working memory, executive functioning, etc.) that may impact learning* (Prompt 9, SQ7) for the entire sample (All).

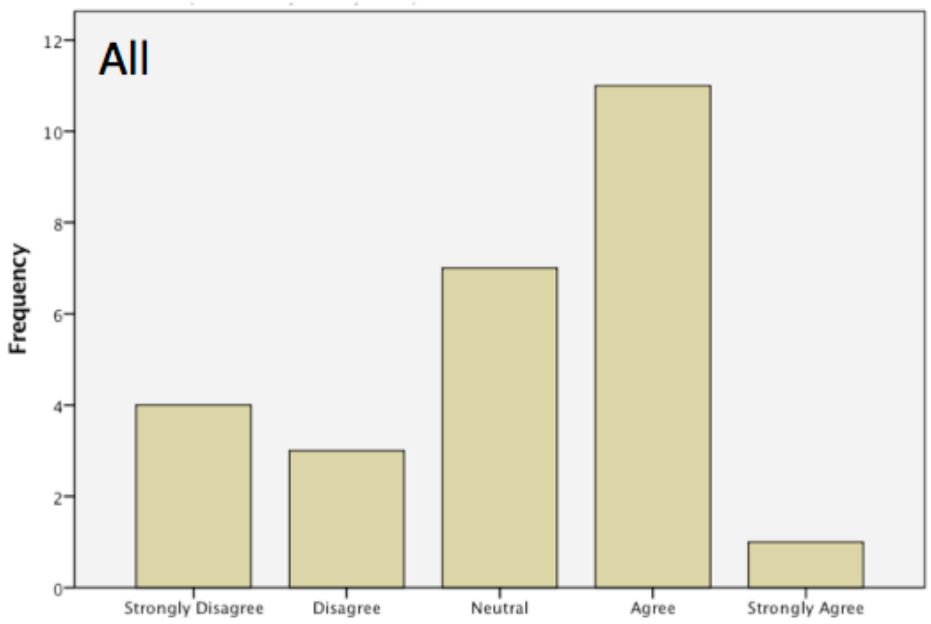


Figure 21. Histogram for *Kindergarten teachers generally have access to at least one tablet device (Android, iPad, etc.) for use in their classroom* (Prompt 10, SQ7) for the entire sample (All).

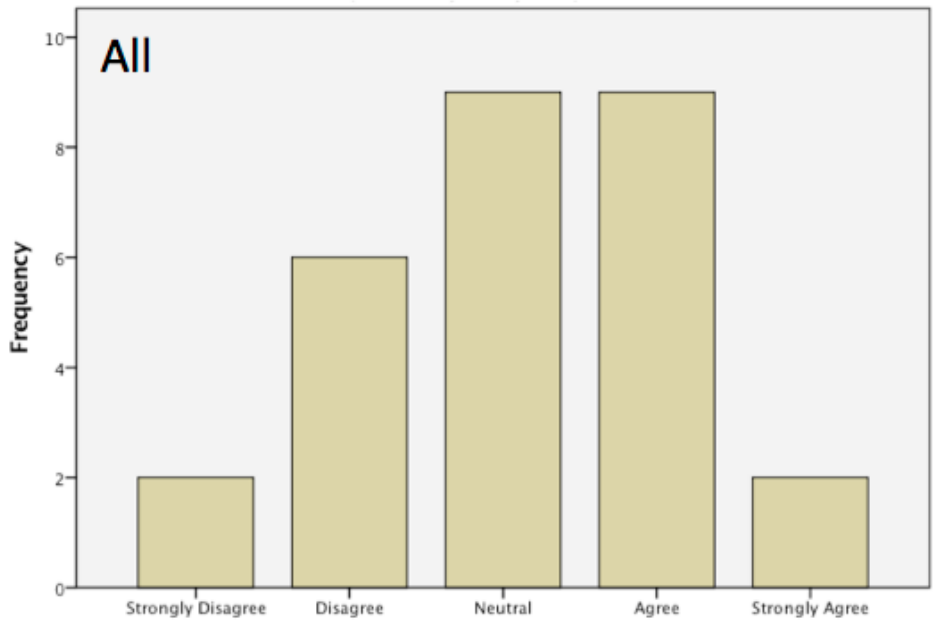


Figure 22. Histogram for *Kindergarten teachers generally are skilled at using tablet devices* (Prompt 11, SQ7) for the entire sample (All).

Appendix

Innovation Need Survey – Project ICEBERG – Fall 2015

UO Project ICEBERG: Innovation Need Survey (Fall 2015)

Welcome to the UO Project ICEBERG: Innovation Need Survey

The following survey asks a range of questions about Preschool and Kindergarten practices to address learning difficulties. Please answer all questions based on your experience. Your time and feedback are valued, and your responses will be anonymous.

Also, note that you might receive access to this survey through multiple avenues. Please complete the survey only one time.

Thank you for participating.

Project ICEBERG: Innovation Need Survey

UO Project ICEBERG: Innovation Need Survey (Fall 2015)

Part I: Overall Impressions

* 1. Please select the option that BEST defines your role in relation to Preschool / Kindergarten services.

- ○ Preschool Educator
- ○ Kindergarten Educator
- ○ Building Administrator
- ○ Administrator (Other)
- ○ Parent
- ○ Other (please specify)

* 2. Please describe your role in relation to Preschool / Kindergarten services.

* 3. Share your thoughts about the importance of early screening information (Preschool & Kindergarten) for preventing learning difficulties.

* 4. Describe shortcomings in current practices related to the prevention of learning difficulties.

* 5. How might a tablet-based system (e.g., Android, iPad) designed to bring teachers information about their students' learning, behavioral, and cognitive functioning be of benefit in early learning environments?

UO Project ICEBERG: Innovation Need Survey (Fall 2015)

Part II: PRESCHOOL

* 6. Please respond to each of the following questions related to**PRESCHOOL** teachers.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Insufficient Experience to Respond
Preschool teachers have sufficient information about their students' emergent literacy skills.	○	○	○	○	○	○
Preschool teachers have sufficient information about their students' emergent math skills.	○	○	○	○	○	○
Preschool teachers have sufficient information about what aspects of their students' behavior may impact learning.	○	○	○	○	○	○
Preschool teachers have sufficient information about what aspects of their students' cognitive functioning (working memory, executive functioning, etc.) may impact learning.	○	○	○	○	○	○
Preschool teachers are skilled in the use of student assessment results to support student instructional needs.	○	○	○	○	○	○
Preschool teachers are skilled at assessing learning difficulty risk based on their students' emergent literacy skills.	○	○	○	○	○	○
Preschool teachers are skilled at assessing learning difficulty risk based on their students' emergent math skills.	○	○	○	○	○	○

Project ICEBERG: Innovation Need Survey

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Insufficient Experience to Respond
Preschool teachers are skilled at assessing learning difficulty risk based on aspects of their students' behavior that may impact learning.	○	○	○	○	○	○
Preschool teachers are skilled at assessing learning difficulty risk based on aspects of their students' cognitive functioning (working memory, executive functioning, etc.) that may impact learning.	○	○	○	○	○	○
Preschool teachers generally have access to at least one tablet device (Android, iPad, etc.) for use in their classroom.	○	○	○	○	○	○
Preschool teachers generally are skilled at using tablet devices (Android, iPad, etc.).	○	○	○	○	○	○

7. Any other comments:

UO Project ICEBERG: Innovation Need Survey (Fall 2015)

Part III: Kindergarten

* 8. Please respond to each of the following questions related to**KINDERGARTEN** teachers.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Insufficient Experience to Respond
Kindergarten teachers have sufficient information about their students' emergent literacy skills.	○	○	○	○	○	○
Kindergarten teachers have sufficient information about their students' emergent math skills.	○	○	○	○	○	○
Kindergarten teachers have sufficient information about what aspects of their students' behavior may impact learning.	○	○	○	○	○	○
Kindergarten teachers have sufficient information about what aspects of their students' cognitive functioning (working memory, executive functioning, etc.) may impact learning.	○	○	○	○	○	○
Kindergarten teachers are skilled in the use of student assessment results to support student instructional needs.	○	○	○	○	○	○
Kindergarten teachers are skilled at assessing learning difficulty risk based on their students' emergent literacy skills.	○	○	○	○	○	○

Project ICEBERG: Innovation Need Survey

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Insufficient Experience to Respond
Kindergarten teachers are skilled at assessing learning difficulty risk based on their students' emergent math skills.	○	○	○	○	○	○
Kindergarten teachers are skilled at assessing learning difficulty risk based on aspects of their students' behavior that may impact learning.	○	○	○	○	○	○
Kindergarten teachers are skilled at assessing learning difficulty risk based on aspects of their students' cognitive functioning (working memory, executive functioning, etc.) that may impact learning.	○	○	○	○	○	○
Kindergarten teachers generally have access to at least one tablet device (Android, iPad, etc.) for use in their classroom.	○	○	○	○	○	○
Kindergarten teachers generally are skilled at using tablet devices (Android, iPad, etc.).	○	○	○	○	○	○

9. Any other comments: