

## Development, Validation, and Field Testing of “Readiness” Instruments for the State of Hawai‘i

### Schools Ready for Children and Children Ready for School

—Mary E. Brandt, Ph.D. and Donna Grace,

How do you measure “readiness?” Is the measurement meaningful, especially to teachers and schools? Does the measurement of “readiness” increase as children and schools improve? These were the large questions we asked as we began this research project as part of the Hawai‘i readiness initiative of the School Readiness Task Force. Our measurement foundation was laid by earlier work of this initiative. After all, to measure such an abstract idea as “readiness,” we needed to know what “readiness” is, particularly in our multi-cultural state. So we asked Hawai‘i’s early childhood community—parents, teachers, and administrators about what school and child characteristics would help ensure successful early learning experiences in kindergarten.<sup>1</sup> From these results, the readiness task force crafted a “readiness” definition that was formally adopted by the state of Hawai‘i:

Young children are ready to have successful learning experiences in school when there is a positive interaction among the child’s developmental characteristics, school practices, and family and community support.

This definition reflects the ecological view of child development and learning.<sup>2</sup> That is, learning is firmly set in the social and cultural context surrounding the child. In Hawai‘i, this social and cultural context is both real and unique. Thus, the use of a commercial test developed and validated elsewhere in the country would be neither theoretically sound, nor pragmatically helpful.

Our measurement work was driven by the demand for accountability. Hawai‘i policy makers, funding agencies, and legislators were asking for reliable early childhood data to track the impact of early childhood initiatives in Hawai‘i: Are these efforts enabling more children to be ready to succeed in kindergarten? And are children entering schools that are more able to support successful learning of young children? The data on both questions were required by the state’s “readiness” definition.

Thus, our specific purpose was to develop, validate, and field test *two* assessment instruments, *Schools Ready for Children* and *Children Ready for School*. We will first describe

the development of the assessment instrument dealing with policies and practices of “ready” schools. The items on this instrument should indicate the *readiness of schools* to provide young children and their families with experiences that contribute to successful learning. The background of the elementary schools and preschools whose principals and directors participated are presented. This is followed by our validation and field test findings. Lastly, recommendations for revision of the *Schools Ready for Children* instrument and for further research are made. Similar information is presented for the assessment instrument dealing with children’s characteristics and skills seen as necessary for successful learning experiences in kindergarten. We end with a postscript.

### Schools Ready for Children Instrument

#### Development

The content of the items were developed based on (1) research<sup>2</sup> that was conducted in Hawai‘i on school policies and practices that promote success in kindergarten, and (2) a review of the relevant National Association for the Education of Young Children (NAEYC) policies and positions. Ease, clarity, and breadth dictated the design of the instrument, particularly the number of items and the response options. An evaluative feedback form was used to gather information regarding time, training, directions, and usefulness of the instrument.

#### Description

The instrument had eleven items dealing with six school policies and practices: transition, communication, parent involvement, early childhood classroom practices, parent education, and school improvement focused on early childhood areas. Please see Table 1. Two response options were used: *not yet/beginning* and *well established*.

#### Participating Schools

Forty-one elementary school principals (thirty-seven public and four private schools) and twenty preschool directors participated. About half the elementary schools and

about two-thirds of the preschools were classified as serving students of low socio-economic status (SES).

## Discussion

Simple descriptive statistics were used, along with qualitative analysis of the few comments, to address a series of validity questions.

- (1) Is the instrument sensitive to differences between preschools and elementary schools, and in SES of the schools?
  - ❖ Preschool directors reported having more school readiness policies and practices in place than did elementary principals.
  - ❖ More preschool directors (70%) than elementary principals (37%) have backgrounds in early childhood; and more preschools (50%) than elementary schools (15%) are accredited.
  - ❖ All principals of the low-SES schools found the information from the instrument to be helpful in planning future school policies and practices to support readiness for school success. This compares to 70% of the principals from high-SES schools.
  - ❖ More principals in high-SES schools have taken courses in early childhood education than those in low-SES schools.
  - ❖ More principals in high-SES elementary schools reported having well-established readiness policies and practices in place than did principals in low-SES schools.
- (2) Is the *Schools Ready for Children* Instrument accurate and reliable?
  - ❖ 100% of the preschool directors and 39 of the 41 principals reported that the instrument was manageable to complete in a reasonable amount of time, and the directions were clear and understandable.
  - ❖ 95% of the principals and 100% of the preschool directors stated that they did not need training to complete the survey.
  - ❖ 100% of the principals and directors reported being from *confident* to *very confident* in the accuracy of their ratings. However, preschool directors, more often than principals, reported being *very confident*.
  - ❖ For a large proportion of the items, there was limited

differentiation among respondents. Responses tended to “bunch” into one response option.

## Refinements and Revisions

**Survey Content.** Expansion of two categories were recommended: (1) the transition category regarding a school’s early childhood written transition plan and its incorporation in the school’s written improvement plan; and (2) early childhood practices category concerning how teachers are assigned to kindergarten classrooms and/or whether hiring practices consider early childhood education backgrounds of teachers and the current background status of teachers.

**Survey Response Structure.** Changes in two areas would give a more accurate and a more differentiated picture of schools’ “readiness” policies and practices. First, increasing the response options from two to three would allow principals to more accurately identify the “quality” or implementation level of each school practice and policy. Second, rewording the few grossly undifferentiated items, specifically the items on early childhood classroom practices, would also provide more accurate data.

**Value of the Data.** Providing suggestions about how the results may be used at the school for school improvement would be a “value-added” feature of the instrument.

## Future Research

Greater in-depth validation of the accuracy of the responses would be warranted. This could be done by conducting interviews of principals and/or school leaders regarding their responses, and by confirming certain responses via examination of school documents. There is also a need to validate the sensitivity of the *Schools Ready for Children* summary analyses for reporting and tracking changes in schools’ early childhood policies and practices.

## Children Ready for School Instrument

Because young children would be assessed with this instrument, we recognized a potential for misuse.<sup>4</sup> For example, we worried about the possible harm that might arise if the results were used, even unintentionally, to prevent children from entering kindergarten, or if “not ready” labels attached to children would lower teachers expectations and their efforts on a child’s behalf. In addition, we were aware of the history of using tests that were validated for one thing, such as screening, being used for something else, such as retention or promotion decisions. A test is only valid for the purposes and uses for which it was developed.<sup>5</sup> As one measurement

expert said, “There is one overriding rule for determining test validity: Validity depends on how the test results are used.”<sup>6</sup>

Thus, we felt that we must make explicit the purposes and uses for this *Child Ready* instrument:

*The instrument was designed (1) to track improvement over time of cohort groups as they enter kindergarten for school and system level use; and (2) for curriculum planning purposes so that schools (and kindergarten teachers within them) can use the classroom and aggregated school results to examine curriculum areas for instructional purposes.*

*The instrument was explicitly **not** designed to test individual children for diagnostic or prescriptive purposes. A far more detailed, in-depth, and well-researched instrument would be needed for this purpose. It was **not** designed for assessing the instructional needs of individual children. Again, a more detailed and in-depth instrument should be used for that purpose. And finally, it was not designed to make decisions about whether a child is “ready” or **not** “ready” for kindergarten. No instrument can be designed for that purpose since the definition of “readiness” embraced by the state of Hawai‘i is an interactional one.*

### Description of the Instrument

The content of the instrument was guided by the Hawai‘i Preschool Content Standards adopted by the state. It uses the professional judgment of teachers for rating children’s on-going behaviors in the classroom, and consists of 24 items of key skills and characteristics that the early childhood community in Hawai‘i consider essential to success in kindergarten.<sup>2</sup> Two forms of the instrument were designed: an individual form used to examine change over time and determine internal coherence; and a class profile form for ease and feasibility of use by classroom teachers. Both forms contained the same 24 items. They differed in rating options and rating scales. The individual form asks teachers to rate on a 3-point scale the extent to which a child consistently displays each of the behaviors from *Not Yet* to *Consistently*. The class profile asks teachers to rate on a 5-point scale the proportion of the class that consistently displays behaviors from *Almost None* to *Almost All* (see Table 2).

### Description of Participants and Method

Twenty-one preschools and thirty-nine elementary schools participated. Overall, fifty-one preschool teachers and 140 kindergarten teachers used either the individual

or class profile form. Data were collected and entered into SPSS database on a total of 840 students (331 preschool and 509 kindergarten students) using the Individual form and on 3,053 students (686 preschool and 2,367 kindergarten students) using the class profile form. The teachers provided the ratings in mid-to-late October of the school year. Consequently, many of the children had from six weeks to approximately three months of kindergarten experience.<sup>3</sup> Therefore, the absolute ratings from the instrument do not represent entry-level skills and characteristics of kindergarten children in the sample. Rather, the ratings reflect some degree of school experience as noted by teacher comments made on the feedback survey. Preschool teachers who had completed the individual form on preschool students (n = 331) in October did so again on the same preschool students (n = 277) in May. With these data, we could analyze the sensitivity of the 24 items on the instrument for change over time, an essential feature of an assessment instrument for young children.

The teachers also completed a feedback survey as part of field testing, and noted their degree of confidence in the accuracy of their ratings of children and the degree of importance of each rating to success in the classroom of the 24 “readiness” characteristics. Socio-economic status (SES) of the school-community was used as a proxy for SES of the students within the schools. The students within the participating preschools were more likely to be from families of high- and middle-SES families than were the kindergarten students in the participating elementary schools. Therefore, direct comparison between the two age groups would be misleading. Cautions about SES comparisons were explicitly made in the full report.

### Research Questions: Validation and Field Testing

We looked at three major, multi-part validation and field test research question

1. Is the instrument *sensitive* to diversity in young children’s normal learning, development, and background experiences? That is, is the instrument sensitive to
  - ❖ changes over time?
  - ❖ differences in preschool attendance?
  - ❖ differences in socio-economic background experiences?
  - ❖ normal diversity of the age group?

2. Does the instrument *accurately and reliably* measure “readiness” characteristics of four-to-five year old children? That is,

- ❖ how confident are teachers in the accuracy of their ratings?
- ❖ how important are the “readiness” items to classroom success?
- ❖ can a variety of behaviors serve as indicators of “measured” characteristics? That is, do the items allow for individual differences in the display of underlying competence?
- ❖ is training needed to use the instrument?
- ❖ how clear are the directions?
- ❖ do the items reflect observable behaviors?

3. Is the instrument *feasible and helpful* to classroom teachers? That is,

- ❖ is the time needed to complete the ratings reasonable?
- ❖ is the rating process (awareness of the “readiness” characteristics obtained by using the instrument) helpful?
- ❖ is the instrument a useful tool for overall curriculum planning?

## Results and Discussion

The results are summarized and discussed by each of the major research questions.

### Sensitivity of the Instrument

**Changes Over Time.** Ratings of all twenty-four items had statistically significant increases from October to May for the same preschool children.<sup>4</sup> Although significant, the amount of improvement on a number of items was small, reflecting both these items’ high fall ratings for the predominantly middle-to-high-SES preschool sample and the limited room to improve given the 3-point rating scale.

**Differences in Preschool Attendance.** Differences between the kindergarten children who had attended and had not attended preschool prior to kindergarten entry were statistically significant for all but one of the twenty-four items.<sup>5</sup> In every case, those who had attended preschool had higher mean ratings than those who had not. Some items had relatively large differences between the two groups given a three-point rating scale, while differences on other items, although significant, were small.

**Socio-economic Status (SES).** Only relatively gross measures of SES were possible. Thus the findings here are suggestive and will need confirmation. On the individual form, SES was statistically significant for twenty of the twenty-four items for the preschool group and for all twenty-four items for the kindergarten group. For the kindergarten class profile form, 20 of the 24 items were statistically significant.<sup>6</sup> Post tests showed that in almost every instance, high SES groups had statistically higher ratings than low SES group and in many instances were higher than the middle SES group. Anomalies were few.

**Responsiveness to Individual Diversity.** The class profile form had a sufficient number of rating options to capture the expected range of normal differences in the skills or characteristics of young children. However, the three-point scale on the individual form should be extended to four to improve the discriminatory power of the instrument, as many ratings were close to the maximum.

### Accuracy and Reliability of the Instrument<sup>6</sup>

**Teacher Confidence in Accuracy:** Between 96% and 100% of the preschool and kindergarten teachers expressed confidence in the accuracy of their ratings and few felt they needed training to carry out the assessment. These suggest that use of the instrument, particularly the class profile form, results in fairly accurate information at the system level, and it also suggests that this is a feasible and relatively inexpensive way to collect needed system data.

**Importance to Success.** Overall, the kindergarten teachers rated all twenty-four items high in importance. This finding supports the content validity of the instrument. That is, the items do represent a set of key characteristics important for a successful learning experience in kindergarten. For preschool teachers, the items pertaining to academic-cognitive knowledge were rated as less important. This finding suggests that preschool directors and teachers may want to focus more curricular attention on this area as children approach kindergarten age. In addition, the items showed internal coherence. All twenty-four items had statistically significant correlations with one another and had internal clusters that were conceptually sensible. Thus the selected items seem adequately to represent the concept of “readiness” for success in kindergarten.

**Multiple Behaviors As Indicators.** The items were written so that multiple behaviors could serve as indicators of the “readiness” skill or characteristic. The teachers con-

curred. Between 95% and 100% of the preschool and kindergarten teachers reported that the “readiness” items allow for a variety of child behaviors to be examples of the readiness characteristics or skills. This finding supports validity of the items in terms of sensitivity to individual and/or cultural expression of the skills or characteristics.

**Clarity of Directions and Training.** Almost all teachers (98% of kindergarten teachers, and 100% of preschool teachers) found the directions to be clear and understandable. Few teachers thought training would be helpful. A slightly larger percentage of kindergarten than preschool teachers were comfortable without training and more teachers felt no training was needed for the class profile form than for the individual form.

**Use of Observable Behaviors.** Between 92% and 97% of the preschool and kindergarten teachers felt that they could observe the behaviors indicative of the skill or characteristic to be rated. Thus, this finding supports the validity of the methodology used for data collection, i.e., teachers judgments based on observations of behaviors of children in the classroom setting.

#### Feasibility and Helpfulness of the Instrument <sup>6</sup>

**Feasibility.** Teachers found the class profile form to be easier to use and less time-consuming than the individual form. Thus, the class profile form is respectful of teachers’ professional responsibilities and time. For data collection, the use of class profile form resulted in more complete data and resulted in a more accurate trend analysis and tracking of improvement.

**Helpfulness.** Between 98% and 100% of the preschool and kindergarten teachers reported that the child profile form was either useful or very useful to them. The percentages were somewhat lower for the individual form (85%–95%). In addition to use as a data collection instrument for tracking system improvement, the process of observing and recording children’s behaviors also has more direct benefits to the classroom teacher.

#### Conclusions and Recommendations

Overall, the instrument, particularly the class profile form, appears sufficiently sensitive, accurate, and feasible to use in tracking school and system level changes in children’s kindergarten entry-level skills. It also may be used for initial classroom-level curriculum planning by kindergarten teachers.

However, certain revisions, recommendations, and

future research are necessary. These include the following: (1) the scale on the individual form should be expanded from three points to four points; and (2) the wording for the items are clear and understandable, but revision of items representing small and large motor development are needed to enhance clarity and distinctiveness from other items.

The following recommendations were made:

- ❖ Additional data should be gathered to obtain more precise findings regarding the instruments sensitivity to differences in children’s SES. A joint project with KCAA is underway and any revisions as a result of this study should be made in the instrument.
- ❖ The class profile, not the individual form of the *Children Ready for School* instrument, should be used for wide-spread and system level use. The individual form was developed primarily for assessing the sensitivity of the instrument to change in children over time.
- ❖ Ratings from the *Children Ready for School* instrument should be aggregated at the school and system level in order to gather base-line data on child readiness in Hawai’i and to track improvements over time. If individual children are scattered throughout the system and entry-level data are needed, it is possible to use the individual form only if the results are summarized across children and confidentiality of children and families is maintained.
- ❖ It is critical that a geographically targeted follow-up study is conducted to examine whether improvements and investment in community, family, and early childhood outreach programs are reflected in changes in kindergarten entry skills or characteristics as measured by the class profile instrument.
- ❖ Teachers should use the aggregated classroom ratings to examine the curriculum areas that should be the focus of instruction. Some assistance in doing so may be needed.
- ❖ The *Children Ready for School* instrument is not to be used for diagnostic or prescriptive purposes with individual children, for assessing individual instructional needs of a child, nor for determining the “readiness” of individual children for kindergarten.
- ❖ Critical decisions remain—where, for example, will the data from these assessments be housed, and who will be responsible for annual collecting, analyzing, and reporting of data?

Table 1. Revised items, response options, and ratings for the assessment of an elementary school's readiness for entering kindergarten children.

School Policies and Practices	Not Yet Just beginning	Informal Depends on individuals	Well Established Institutionalized
1. The school has a special orientation for and/or invites incoming children and their families to visit the school before the school year begins.	1	2	3
2. The school has a systematic procedure for providing information between home/school or between preschool/kindergarten teachers about the strengths and needs of entering kindergarten children.	1	2	3
3. The school uses multiple approaches to communicate with families such as home visits, newsletters, phone calls, parent workshops, email.	1	2	3
4. The school communicates information to families about:			
(a) child development and learning	1	2	3
(b) opportunities for parent to be involved with their child's learning and with the school	1	2	3
(c) agencies in the community that provide social, health, and other services to families	1	2	3
5. School has a variety of ways for parents to be involved with the school such as classroom volunteers, work at special events, fund raising, telephone tree, etc.	1	2	3
6. On a regular basis, the school conducts a self-examination of its curriculum and instructional practices in early childhood (ages 3 to 5 or grades K to 2) that considers current ideas and research in early education.	1	2	3
7. The school has in place a well-developed family literacy program, i.e, the program is accessible to families, well publicized, and on-going.	1	2	3
8. The school offers on-going parent workshops on child development and learning (in contrast to a single event).	1	2	3
9. Teachers are given opportunities for professional development specifically focused on early childhood education.	1	2	3
10. There are a variety of hands-on activities available in the classroom for kindergarten children to choose	Little to none	Some variety	Great deal of variety
11. The daily classroom schedule provides a balance between:			
(a) between teacher-directed and child-initiated activities	Not balanced	Uneven - balanced now & then	Consistently well balanced
(b) between active and quiet activities			
(c) between independent and guided activities			
(d) between large group, small group, and individual activities			
12. The school has a written transition plan to assist parents and entering K children, which includes actions for improvement.	No or neglected	Written but followed now & then	Written & consistently followed.
13. Which practice best describes how teachers are assigned to teach kindergarten to grade 2 at your school:			
(a) teachers are rotated through the grade levels and are expected to be capable of teaching all elementary grade levels.			
(b)			
(c) teachers with specific backgrounds in early childhood education/child development are given priority to teach kindergarten to grade 2.			
(d) Other-please describe			

Table 2. Class Profile Form with revised items for the assessment of entering kindergarten children.

What proportion of your entering kindergarten class <b>consistently</b> displays the following skills or characteristics? Almost none = 1 About a fourth = 2 About one half = 3 About three fourths = 4 Almost all = 5
1. Comes to school well rested, fed, and alert.
2. Practices personal hygiene such as washes hands after toilet and before eating.
3. Is independent in caring for self and own belongings.
4. Needs minimal support to adjust to new people and new places.
5. Works and plays well with others.
6. Show satisfaction in accomplishments.
7. Expresses emotions through appropriate actions and words.
8. Is respectful of others.
9. Is able to listen for about 15 minutes to group discussions and stories read aloud.
10. Is able to follow class routines.
11. Shows eagerness to learn by observing, asking questions &/or exploring new things.
12. Tries hard and persists.
13. Appears interested in the world around them (curious).
14. Communicate ideas and describes things using phrases and sentences.
15. Shows familiarity with how books work (e.g., holds book right side up; turns pages from front to back, etc.)
16. Show interest in books and print (e.g., looks at books, asks to be read to, etc.).
17. Knows names and sounds of some (5 or more) letters.
18. Uses symbols, scribbles, or letter-like forms to "write" words or ideas.

❖ The funding and conduct of the geographically targeted, follow-up study should be resolved among the major early childhood partners in the state. This study is needed in order to examine whether improvements and investment in community, family, and early childhood outreach programs are reflected in changes in kindergarten entry skills and characteristics as measured by the class profile instrument.

### Future Research

The findings of this research would be enhanced by (1) assessing inter-rater reliability in the use of the instrument, (2) adding a teacher interview component to better explain any anomalies or unexpected findings, and (3) determining if investment in early childhood is correlated with improvements in entry level skills.

## Postscript

Both instruments were revised and used for the first time in fall 2004.<sup>10</sup> What did we find out? About 20% of the 148 participating elementary schools have well established policies and practices in place, with just one school having all firmly established. This means that many of our schools need to do more to support successful learning experiences of entering kindergarten children.

And what about children who are entering kindergarten? The class profiles of 524 classrooms show that about six out of ten children are well prepared in all developmental domains. Physical well-being and social-emotional behaviors were their strongest attributes. Emergent math and emergent literacy skills were the weakest. In only 6% of the classrooms were all entering kindergartners well prepared in literacy and math.

In 2005 Governor Lingle introduced legislation and budget proposals to enhance and expand early childhood education initiatives.<sup>11</sup> Hawai'i is now on its way to making a difference in young children's education.

## Endnotes

1. See Feeney, S., Grace, D. and Brandt, M. (December 2001). *Ready for Success in Kindergarten: A Comparative Study of Community Beliefs*. Honolulu: Hawai'i Educational Policy Center, University of Hawai'i -Mānoa.
2. Urie Bronfenbrenner (1993). "The ecology of cognitive development." In R.H. Wozniak & K. Fischer (Eds.). *Scientific environments*. Hillsdale, NJ: Erlbaum, pp. 3-44; Urie Bronfenbrenner (1994). "Ecological models of human development." In T. Husen & T.N. Postlethwaite (Eds.). *International encyclopedia of education*, 2<sup>nd</sup> Ed., v. 3, Oxford, UK: Pergamon Press Elsevier Science, pp. 1,643-1,647; and Lev Vygotsky (1978). *Mind in society*. Cambridge, MA: Harvard Press.
3. At the time of writing, Hawai'i public schools follow a variety of school calendars with some opening as early as July and others just after Labor Day in September.
4. See Samuel J. Meisels. (1989). "High Stakes Testing in Kindergarten." *Educational Leadership*, 16-22; Lorrie A. Shepard & Mary Lee Smith (November 1986), "Synthesis of Research on School Readiness and Kindergarten Retention." *Educational Leadership*, 78-86; Jeannie Oakes, (1992). "Can Tracking Research Inform Practice?" *Educational Researcher*, 12-21; Kelvin Welner & Jeanne Oakes (1996). "Ability Grouping: The New Susceptibility of School Tracking Systems to Legal Challenges." *Harvard Educational Review*; John Hollifield (1987), "Ability Grouping in Elementary Schools." *ERIC Clearing House on Elementary and Early Childhood Education*, Urbana, IL: ERIC Digest, [www.ericfacility.net/ericdigests/ed290542.html](http://www.ericfacility.net/ericdigests/ed290542.html); and C. Cybele Raver & Edward Zigler (2004). "Another Step Back? Assessing Readiness in Head Start." *Journal of National Association for Education of Young Children*, [www.journal.naeyc.org/btj/200401/raver.asp](http://www.journal.naeyc.org/btj/200401/raver.asp).
5. Samuel Messick, (1989) "Validity," in *Educational Measurement*, ed. R. L. Linn. New York: Macmillan, 13-103.
6. Norman Gronlund (1985). *Measurement and Evaluation in Teaching*. NY: Macmillan.
7. SPSS paired-t test (one-tailed alpha .05) was used. For the means, standard deviations (SD), paired t-test values, df, and significance levels for the twenty-four items, please see Appendix A of the full report.
8. SPSS ANOVA, one-tailed alpha .05 and Tukey Posttest for differences among the three levels of SES, (one-tailed alpha) were conducted. For means, f ratios, and more details of the analyses please see Appendix A and B of the full report.
9. Please see Appendix C of the full report.
10. The Good Beginnings Alliance, with a grant from the Castle Foundation and with the assistance of the Department of Education made this ground breaking event a reality. The results are posted on the Department of Education, Evaluation Section website, <http://arch.k12.hi.us>. Look for Hawai'i State and School Readiness Assessment (HSSRA) reports.
11. See FACT SHEET: Investing in Hawai'i's Future-Expanding Early Childhood Education, (February 28, 2005), Office of the Governor, [www.Hawaii.gov](http://www.Hawaii.gov). Table 1. Revised items, response options, and ratings for the assessment of an elementary school's readiness for entering kindergarten children.

