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ABSTRACT

Recent research has revealed that informal inventories of students' abilities can be useful in reading diagnosis. Teachers need to be aware of the occasions during the school day which permit informal observation or testing of skills related to reading. The purpose of this study was to determine if classroom teachers, through informal observation methods, could recognize indicators of intellectual functioning. The original study involved 11 teachers and 195 children enrolled in kindergarten through grade 6; a replication of the study involved 14 teachers and 280 students in kindergarten through grade 12. In both studies, teachers observed students and recorded ratings of intellectual capacity by using the Ruth Strang Informal Observation of Capacity Inventory. Data indicated that the use of an informal inventory is justified, that teachers can use an informal inventory in order to make decisions concerning children's intellectual capacity, that these estimates of capacity are reasonably accurate, and that the Strang Inventory is appropriate for use with a heterogeneously grouped class. (KS)

"A STRATEGY FOR COMPARING FORMAL AND INFORMAL TESTING"

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Introduction

Teachers continue to search for possible ways to guide children toward success in reading. Determining strengths and weaknesses of students early in the year is a current practice of effective reading teachers. Instructional plans are individualized according to the results of diagnoses. If teachers understand both children and the reading process, they are able to become true facilitators of learning.

Informal reading inventories have been established as useful instruments for evaluating the reading progress of children (Kender, The Reading Teacher, 1970). The Informal Reading Inventory is viewed as a sampling procedure designed to give a teacher some direction with regard to instructional procedures. The strength of the IRI is not as a test instrument but as a strategy for studying the behavior of the learner in a reading situation (Pikulski, The Reading Teacher, 1974).

IRIs have proven to be useful when placed in the hands of competent professionals who can compensate for their limitations. Margaret Early (Phi Delta Kappan, 1976) stresses the importance of teacher judgment and experience in making diagnostic evaluations. She deplores the use of computer numerical scores. Maginnis (The Reading Teacher, 1972) states, "the inclusion of teacher judgment in the measurement process may add some credibility to estimates of capacity for reading."

M. Early (Phi Delta Kappan, 1976) predicts that future studies will make greater use of observational technqiues, interviews, introspection, and laboratory simulations employing computers and recording devices. Thus the future invites greater creative approaches to investigations of learning and of learning to read. K. Goodman (The Reading Teacher, 1976) states, "No instructional package can replace enlightened teachers."

We may say that, "An informal reading inventory is not a single thing; it is many things" (McCracken, The Reading Teacher, 1972). It is a teacher's way of observing or reacting toward what he/she sees. An inventory is taking stock, enumerating, looking at shelves to see what is there, and looking to see what is missing. "A teacher conducts an inventory of each child if he or she pays enough attention to each child's responses to be able to tabulate, to count, and to evaluate his responses..." (McCracken, The Reading Teacher, 1972).

Teachers need to be aware of the numerous occasions during the school day which permit informal observation, checking, or testing of the various factors and skills related to reading. Such evaluation should be carried out informally in situations in which children can show functional and realistic application of skill (Bliesmer, The Reading Teacher, 1972).

The administration of an Informal Reading Inventory provides a unique opportunity for teacher and pupil to get to know each other. Although time consuming, it can be highly valuable as a tool for useful diagnosis. Dorothy Kendall Bracken states, "We do not have time not to do diagnostic testing." (SMU Reading Conference--April 1971).

Research Background

One approach in diagnosis is to determine capacity for learning, or level of I.Q. Intellectual cpacity has been the foremost consideration in successful reading since the beginning of scientific educational research. Although there are related factors other than intelligence that account for reading retardation, many researchers concur that IQ is a highly significant factor. The studies of Silberberg and others (1969) have led them to conclude that IQ is probably the best single predictor of eventual scholastic success.

Although the measurement of intelligence is a highly controversial subject, it is generally believed that there are certain essential criteria of intelligence. Among these criteria are memory, ease of learning a new skill, size of vocabulary, ability to solve arithmetic problems, and inferential quality of reasoning (Kagan, 1973).

The relationship of IQ test scores to reading test scores has also interested researchers for many years. Scott (1970) points out that "most reading authorities agree that a child's general intellectual ability is an important ingredient in successful reading." Past research reveals that verbal ability, particularly verbal proficiency, becomes highly important for reading performance as the child proceeds through school. Especially is this true as the act of reading becomes more an information processing task rather than a decoding activity (Bruininks, 1970).

Wallbrown and others (1974) obtained correlations between mental age and reading achievement ranging from .35 to .70. They likewise obtained a correlation of .75 between mental age and the Metropolitan Readiness Test scores. These researchers concluded that mental age scores often correlate substantially with reading achievement. (Wallborwn, Psychology in the Schools, 1974).

Basic research on vocabulary control has been reported by Gates in a series of investigations covering a wide span of years. Gates noted that children vary markedly according to intelligence levels as related to the number of repetitions needed in acquiring reading vocabulary. He estimated the average minimum number of repetitions per word that need to be provided for first grade children at various intelligence levels (Weintraub, The Reading Teacher, 1967).

IQ	Number of Repetitions*
120-129	20
110-119	30
90-109	35
80- 89	40
70- 79	45
60- 69	55

Noelker and Schumsky (1973) used three memory tasks to discriminate between normal and retarded readers: sequencing, memory for form, and memory for position. They state: "The results confirm the findings of other authors in demonstrating a significant difference in sequencing ability between normal and reading-retarded children."

*According to Gates the table should be interpreted cautiously. Some words will need more repetitions and some will need fewer.

Several approaches to the assessment and prediction of learning ability have been advocated to circumvent the limitations of the intelligence test. Among these are the development of systematic teacher observational techniques and the use of achievement tests. One such approach is to have the child engaged directly in learning in order to assess his learning ability.

Listening tests have frequently been used to estimate reading capacity. The probable capacity for reading is shown by the highest book in the series in which the child can comprehend 75 percent of the material when it is read aloud by the examiner. The assumption is that since a student can understand material at a certain level when listening, he should be able to understand material of equal difficulty if he is required to read it (Maginnis, The Reading Teacher, 1972).

Thompson describes listening in this way: "Listening is actually what the mind does with what the ears hear" (Thompson, Education, 1971). Reading, therefore, is a kind of "mental listening" to an author as the reader translates the symbols seen on the print ' page into meaning.

A study by Sewell and Severson (1974) underscores the value of studying the child as he actually learns as opposed to simply assessing what he knows from past experiences. By observing the child under conditions of standardized learning, and by selecting material from the actual body of material to be learned, some of the weaknesses of the IQ test should be eliminated. This should be especially advantageous for the socio-disadvantaged child.

Purpose of the Study

The purpose of the study under consideration today was to determine if classroom teachers, through informal observation, can recognize indicators of intellectual functioning. The Strang "Informal Observation of Capacity Inventory" and Thurstone's Primary Mental Abilities Test were administered.

The Ruth Strang Informal Observation of Capacity Inventory is not found in published form as far as this researcher has been able to determine. (See Appendix A.) Dr. Strang did share it with graduate students in her classes. It includes aspects of intelligence that have often been identified as being significant. Professionals have been trained to use it in estimating capacity for learning to read.

Materials Used and Groups Studied

The original study involved 11 teachers and 195 children attending local and area schools. The subjects were enrolled in kindergarten through grade 6.

The replication study, 1976-77, involved 14 teachers and 280 students in grades K through 12. In both studies the teachers observed the students in their classes and recorded ratings on intellectual capacity using the Strang Inventory.

Records of these ratings were filed with this researcher. Each teacher then administered, scored, and interpreted an appropriate form of Thurstone's Primary Mental Abilities Test. The test scores and the informal inventory of capacity ratings were compared for each child in each particular group. Correlations were computed, using the rank order method (Spearman rho).

The four factors of mental capacity identified by Strang were included in the rating scale: (1) speed of learning, (2) oral vocabulary, (3) organization of ideas, and (4) seeing relationships. Examples of the kinds of tasks assigned in each of the four areas of learning may be found in Appendix B.

The criterion measures for teacher ratings consisted of three classifications of observable pupil performance on the rating scale factors. The five pupils who demonstrated a high level of performance were given a rating of plus by the teacher. The five pupils whose performance was considered by the teacher to be poor were given a rating of minus by the teacher. The remaining pupils were given a check mark as a rating.

Presentation and Analysis of Data

The studies under report were concerned with the development of a rating scale involving certain identifiable factors of mental function which can be observed by classroom teachers. The studies were further concerned with an investigation of the relationship between pupil scores on the Primary Mental Abilities test and pupil ratings of mental functions by teachers who were using the rating scale.

The data obtained from the studies were tested by the Spearman Rho correlation formula (rank difference), which is considered by some statisticians to be valuable as an exploratory device for discovering whether any correlation is present. Rho is especially useful when factors to be studied cannot be measured directly, such as the teacher ratings of the subjects.

Statistical treatment of the original data indicated significant correlations. The .05 level of significance was designated as the point of acceptance of the positive hypothesis. Ten out of the eleven groups showed significant correlations. Seven of these correlations were significant at the .01 level or better, and three others were significant at the .05 level or better.

Analysis of the data collected from the replicated study (1976-77) involving 14 teachers in grades K through 12 also indicated significant correlations. Two of the 14 groups were excluded from this study because they were not heterogeneously grouped. One was made up of accelerated learners and the other was made up of learning disability students. Eight groups had correlation coefficients at .01 level of significance. Three groups, F, G, & H, had coefficients that were not significant.

Correlation coefficients and levels of significance are presented in Table I.

TABLE I

SPEARMAN RHO CORRELATION COEFFICIENTS AND LEVELS OF SIGNIFICANCE BETWEEN PUPIL SCORES ON PRIMARY MENTAL ABILITIES TEST AND TEACHER RATINGS BY STRANG METHOD

Group	p	Level of Significance
Teacher A	.80	.01
Teacher B	.91	.01
Teacher C	.81	.01
Teacher D	.98	.01
Teacher E	.92	.01
Teacher F	.33	NS
Teacher G	.52	NS
Teacher H	.57	NS
Teacher I	.75	.01
Teacher J	.72	.01
Teacher K	.77	.01
Teacher L	.57	.05

The data collected from the two studies, 475 students, seems to indicate that the Ruth Strang strategy of rating capacity for learning is valid. nineteen out of 23 groups had significant correlations coefficients.

CONCLUSIONS

The following conclusions were based on the findings of the two studies:

1. The research examined validates the use of an informal inventory in evaluating individual children's intellectual capacity.
2. Teachers can successfully use an informal inventory in making decisions about intellectual capacity of children.
3. Teachers can be expected to be reasonably accurate in making estimates of intellectual capacity.
4. The Ruth Strang Informal Observation of Capacity Inventory is appropriate for use with a heterogeneously grouped class.

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APPENDICES

Appendix A

RUTH STRANG'S INFORMAL OBSERVATION OF CAPACITY

Names of Students	Speed of Learning	Oral Vocabulary	Organization of Ideas	Seeing Relationship of Ideas	Total Rating
1.					
2.					
3.					
4. 5. 6. etc.	Record the extremes + by first 5 who finish - by last 5 who finish ✓ by all the others (an use any learning situation.	Listen to vocabulary used + to indicate extremely good - to indicate extremely poor for age level ✓ to indicate average expression	Things we play with Foods we eat Draw or write depending on age. Older students could classify authors, book title, etc.	Use phrases or sentences and ask child to organize according to meaning.	Summary of 4 categories

Complete IOC on ever child by end of second week of school.

Adapt form for first grade by using items for auditor discrimination of visual discrimination.

Appendix B

Activities Utilized in Ruth Strang's Informal Observation of Capacity

1. Speed of Learning:

   1. Each student was asked to memorize a poem or a part in a play.

   2. Given a mileage chart, students were taught to read it. Then a test using information was given.

   3. Students viewed a filmstrip on transcendentalism and then answered questions based on the film.

   4. A lesson on "outlining" was presented and then students were asked to make an outline of a selection from history.

   5. Taught a song to the class. Checked to see who has or has not learned the words and tune.

2. Oral Vocabulary:

   1. Each student selected a favorite picture and orally explained why he preferred it.

   2. Or told a story about his picture.

   3. Oral book reports were presented.

   4. In class discussed story previously read by students.

   5. Students planned and presented a "sales talk" on a favorite book.

   6. Directed students to play descriptive games, example: "Take word Tree and list all the words that could be used to describe a tree -

      green

      tall

      stately

      rough

3. Organization of Ideas:

1. A worksheet entitled ALL ALIKE was used in which the student examined 3 items and chose a phrase from the Answer Box that described their common factor.

2. An activity entitled DETERMINING CLASS RELATIONSHIPS was used. The student examined 8 words in a box, selected the 5 which were in the same class, and wrote the name of the class.

3. Students were given statements and were asked to classify each as "fact" or "opinion."

4. Students were given a list of 12 topics and requested to rearrange them into a logical topic outline according to the scheme provided.

I.

II.

III.

A.

B.

IV.

A.

B.

C.

D.

E.

5. Organized pictures or words according to foods we eat, tools we use, or authors and book titles.

4. **Seeing Relationship of Ideas:**

   1. Students arranged story cards in sequential order.

   2. Students were asked to identify 3 words out of 5 that were related and indicate the relationship.

   3. Students were directed to do an analogies worksheet.

   4. Students interpreted cartoons.

   5. Students made a modified outline; eg.

"The Polar Bear"

Location	Fur	Habits	Food
far north	thick	Use paws as paddles	fish
	white		seals