Framework for Assessing School Readiness

Maha Arslan [1], Iyad Suleiman, Reda Alhajj, Mick Ridley

Abstract— A computerized platform for assessment of school readiness, covering assessment outcomes about cognitive, socio-emotional competences and temperament/personality characteristics and satisfying the constraints mentioned the paper may offer a substantial added value. It will proceed to a multi-methods, multi-informants integration and will allow a much better exploitation of the assessment data than before. The time is ripe now to construct such a platform.

The computerized assessment of readiness for school is designed to assess and develop the user's various learning skills in the course of the game. The wide variety of games covers different areas of cognitive skill, knowledge and skill. Using advanced multimedia tools. The diagnostic battery enables an evaluation of the child's level of functioning in a number of developmental areas: Comprehension of quantity and mathematical understanding, memory, visual comprehension, auditory comprehension, visual-motor functioning and language functions.

The main goal of the testing of this diagnostic battery is to evaluate the achievements of the third group at the conclusion of third grade in keeping with the predictors of the computerized tests done the year before. Although the numerical size of this group is unknown, on the basis of past data, one can predict that this group will include 80%-85% of the overall kindergarten children in the initial sample. In order to evaluate the validity and the benefit of the proposed battery, the teachers' evaluations and the results of the achievement tests will be checked: In reading, writing and arithmetic- that will be adapted for this study. These data, to be received toward the end of the first grade, will serve as the criteria test of the predictive ability of the battery. Beyond examining the links between expectations and actual achievements, the computerized system's predictors of failure in school are compared to the evaluations of the kindergarten teachers, the psychological services and the tests utilized to predict the children's potential for success or failure given toward the end of the kindergarten year. In the event that there are children who are not promoted to first grade or who are referred to special education, they will be identified at the conclusion of the kindergarten year and the outcomes of the computerized tests for this group will be examined.

Index Terms— Computerized Assessment, School Readiness, Assessment of School Readiness, Compuretized Assesment for School Readiness, Global Assessemnt Profile.

1 INTRODUCTION

IN the first half of the twentieth century, a person who acquired basic reading, writing, and math skills was considered to be sufficiently literate to enter the work force, [16]. The goal back then was to prepare young people as service workers, because 90 percent of the students were not expected to seek or hold professional careers, [30]. The second half of the twentieth century witnessed a rapid shift into more educated societies with more people holding high school and university degrees. Even the last decade of the twentieth century marked the start of a major shift affected by the increased popularity of the Internet. With the emergence of the Internet, however, the world has become more interconnected, effectively smaller, and more complex than before, [11]. Developed countries now rely on their knowledge workers to deal with an array of complex problems, many with global ramifications (e.g., climate change or renewable energy sources). When confronted by such problems, tomorrow's workers need to be able to think systemically, creatively, and critically. [33]; [41].

These skills are a few of what many educators are calling twenty first-century (or complex) competencies (see Partnership for the 21st Century 2012; [40]

Preparing K–16 students to succeed in the twenty-first century requires fresh thinking about what knowledge and skills (i.e., competencies) should be taught in the schools. In addition, there's a need to design and develop valid assessments to measure and support these competencies. Except in rare instances, the current education system neither teaches nor assesses these new competencies despite a growing body of research showing that competencies, such as persistence, creativity, self-efficacy, openness, and teamwork, can substantially impact student academic achievement, [22]; [23]; [24]; [36]; [39]. Furthermore, the methods of assessment are often too simplified, abstract, and decontextualized to suit current education needs. Our current assessments in many cases fail to assess what students actually can do with the knowledge and skills learned in school, [31]. What is needed are new performance-based assessments that assess how students use

- [1] *Maha Arsla, Ph.D. is currently a lecturer in Sakhnin College, Israel, E-mail: maha.arslan@gmail.com*
- *Iyad Suleiman, Ph.D. is currently a lecturer in Max Stern Emek Yezrael Academic College, Israel, E-mail: iyad.suleiman@gmail.com*
- *Reda Alhajj, Full Professor in Computer Science in Calgary University, Canada, Email: rsalhajj@gmail.com*
- *Mick Ridley, Lecturer in Bradford University, UK, Email: M.J.Ridley@bradford.ac.uk.*

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

knowledge and skills that are directly relevant for use in the real world.

One challenge with developing a performance-based measure is crafting appropriate situations or problems to elicit a competency of interest. A way to approach this problem is to use digital learning environments to simulate problems for performance-based assessment, [6]; [9]; [25]. Digital learning environments can provide meaningful assessment environments by supplying students with scenarios that require the application of various competencies.

This chapter describes in detail the method of the framework reviewing the kindergarten teacher's evaluation questionnaire, the computerized assessment of readiness for school, the technological infrastructure of the games, the achievement exams upon completion of the first grade, the data processing and the reliability of the computerized school readiness tool and also the relationships between the three measures.

2 WHY USE WELL-DESIGNED GAMES AS VEHICLE TO ASSESS AND SUPPORT LEARNING?

There are several reasons. First, schools have remained virtually unchanged for many decades while the world is changing rapidly, there are a growing number of disengaged students. This disengagement increases the chances of students dropping out of school. For instance, high dropout rates, especially among Hispanic, black, and Native American students, were described as "the silent epidemic" in a recent research report for the Bill and Melinda Gates Foundation, [29]. According to this report, nearly one-third of all public high school students drop out and the rates are higher for minority students. In the report, when 467 high school dropouts were asked why they left school, 47 percent of them simply responded, "The classes were not interesting". It is necessary to find ways (e.g., well-designed digital games and other immersive environments) to get kids engaged, support their learning, and allow them to contribute fruitfully to society.

A second reason for using games as assessments is a pressing need for dynamic, ongoing measures of learning processes and outcomes. An interest in alternative forms of assessment is driven by dissatisfaction with and the limitations of multiple-choice items. In the 1990s, an interest in alternative forms of assessment increased with the popularization of what became known as authentic assessment. A number of researchers found that multiple-choice and other fixed-response formats substantially narrowed school curricula by emphasizing basic content knowledge and skills within subjects, and not assessing higher order thinking skills, [15]; [28]; [29]. As [20]; [35] argued, though, incorporating performance assessments into testing programs is hard because they are less efficient, more difficult and disruptive to administer, and more time consuming than multiple-choice testing programs. Consequently, multiple choices have remained the dominant format in most K–12 assessments in many country. New performance assessments are needed that are valid, reliable, and automated in terms of scoring.

A third reason for using games as assessment vehicles is that many of them typically require a player to apply various competencies (e.g., creativity, problem solving, persistence, and collaboration) to succeed in the game. The competencies required to succeed in many games also happen to be the same ones that companies are looking for in today's highly competitive economy, [34]. Moreover, games are a significant and ubiquitous part of young people's lives. The Pew Internet and American Life Project, for instance, surveyed 1,102 youths between the ages of twelve and seventeen. They reported that 97 percent of youths, both boys (99 percent) and girls (94 percent), play some type of digital game, [19].

Additionally, [13] found that playing digital games with friends and family is a large as well as normal part of the daily lives of youths. They further observed that playing digital games is not solely for entertainment purposes.

In fact, many youth participate in online discussion forums to share their knowledge and skills about a game with other players, or seek help on challenges when needed.

In addition to the arguments for using games as assessment devices, there is growing evidence of games supporting learning, [37]; [43]. Yet it is required to understand more precisely how as well as what kinds of knowledge and skills are being acquired. Understanding the relationships between games and learning is complicated by the fact that it is necessary to not disrupt players' engagement levels during game play. As a result, learning in games has historically been assessed indirectly and/or in a post hoc manner, [32]; [38]. What's needed instead is real-time assessment and support of learning based on the dynamic needs of players. There is a need to be able to experimentally ascertain the degree to which games can support learning, and how and why they achieve this objective.

3 ASSESSMENT OF SCHOOL READINESS

There are at least three arguments that could be invoked to understand the importance and the impact of evaluating school readiness.

First and the strongest argument by far, is the predominant *formative* character of competence assessment at this age. A correct identification of the most salient aspects of each competence opens the door for efficient interventions, to be remedial or enriching. Relying on a valid assessment, one may precisely circumscribe the target of the intervention and its operational goals. Any individualized instruction requires careful assessment of the existing competences.

Second, a correct assessment of the salient competences may offer critical information for the decision to enter schooling or to delay the integration into the school system, both for parents and children. It is necessary to underline that this information is just one part of the equation but by relying on research data and adequate measurements it is hard to ignore, [26]. It may also predict later academic achievements and adaptation to primary school-life relying on early education of the relevant competences, [42].

Last but not least, the measurement of the efficacy and effectiveness of any program (or curriculum) implemented in early

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

education requires reliable assessment of children competences, able to offer precise information about the baseline and the outcomes of the program (curriculum). Without longitudinal assessment of relevant competences, the superiority of a particular early education program over any other has no empirical support.

To summarize, the assessment of school readiness has a critical practical and theoretical importance. Some of these assessments may be implemented by computer testing, but most of them are not, due to the age of the children and their low computer skills, so they will be administered in a classical format. However, it is extremely important to create a computerized platform capable to offer the management of all the assessment data for each child, collected by using different methods and various informants.

4 Critical competences for School Readiness

Several extensive and authoritative searches of the literature, [8]; [12]; [1] allow us to consider that the most relevant competences for school readiness refer to cognitive development, socio affective development and characteristics related to temperament/personality.

4.1 Cognitive competences

Cognitive competences are the abilities to process information, and may differentiate between general cognitive abilities and curriculum-based (specific) cognitive skills. General cognitive abilities are those involved in almost any kind of problem solving and refer to the processes of attention, memory, language, reasoning and executive functions. Curriculum-based cognitive skills are those knowledge and problem-solving abilities that are the outcomes of a specific curriculum or intervention program in early childhood as for example early literacy skills. They refer, for example, to the ability to recognize several capital letters, perform simple arithmetical operations, and understand the connection between sound and letter. They are relying on general cognitive abilities but they are not direct emergencies from these abilities, requiring domain-specific learning.

4.2 Socio-emotional competences

Socio-emotional competence is a complex construct that has two components: one rather *social*, focused on social information processing and performance in social contexts (e.g., interpersonal interactions, social problem-solving), and another rather *emotional*, concerned with understanding, sending/receiving emotional messages and emotion regulation, [18]; [5]. Although some of the tasks a preschool age child is facing are primarily social (e.g., working cooperatively), whereas others are more emotional (e.g., self-regulation of fear), much of the time they are strongly intermingled, [10]. Consequently, any assessment of social skills should include the assessment of emotional competences. The evaluation of socio-affective abilities at preschool children predicts: (a) Academic success in the first and then later elementary years, even controlling former academic success or cognitive skills, [3]; [14]; (b) Participation in the classroom and acceptance of peers and teachers, [2]; (c) Task persistence and drop-out rate in primary school, [27]; [26]; (d) Delinquency and antisocial behaviour later in life. [17].

4.3 Temperament/personality characteristics

The temperament is referring to those individual differences in reactivity and self-regulation and is assumed to have an important constitutional basis. However, during the early years it strongly interacts with the environment and the regulatory dimensions become more important due to anterior cortical brain development. Beginning with the age of three the temperament begins to be differentiated into personality and later on personality characteristics themselves become more differentiated, approaching *the big five model of personality* (extraversion, agreeableness, conscientiousness, neuroticism and openness to experience). The assessment of temperament and emerging personality characteristics in early childhood may offer salient data for adaptation to school environment and constitute a prerequisite for many remedial interventions. [7].

5 A Computerized Platform for Assessment of School Readiness

A major critique of the existent literature on children's competences concerns the "isolationist" approach: competences are considered as separated entities with no interactions and mutual constraints satisfaction, [4]. Moreover, when evaluated, they are presented separately, one by one, as they occur at the interaction with a specific method and from a specific perspective. It is claimed that irrespective of the used measurements there is a need for integrating the assessment outcomes from various methods and perspectives in a single format or platform.

Also a computerized platform for assessing school readiness may offer a substantial added value for research and practice. Such a platform will offer: (a) an intelligent management of the assessment outcomes; (b) much more information processed from the assessment data than if they will be used disparately. The famous adage of Corbusier, the father of the modern architecture – *form follows function* – is relevant in this context, [21]. Before creating the particular form of any computerized design it is required to set up the critical functions that must be accomplished. Any candidate to the status of computerized platform for assessing school readiness must mutually satisfy the constraints outlined below.

5.1 The platform must create a global assessment profile (GAP)

The assessment outcomes (either stored automatically – for

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

those scales administered on computer version or manually introduced - when the assessment took place on a classical format) should be stored in a database. The user will have the possibility to navigate between these outcomes and to operate upon them so that one can:

1. *Visualize* the developmental profile of each competence or personality characteristic;
2. Perform any *combination and comparison of profiles*: by measured competence, by psychological relevance. In other words, the platform will offer the menu and the user will make the choices, according to his/her needs or interests;
3. Have, in a single format (a Report on School Readiness), *the developmental profile of all competences.* It can be a Word document where, besides the assessment outcomes, the qualified user may add further relevant information, interpretations or recommendations. Overall, this Report on School Readiness will be a valuable tool for deciding whether any child is school ready or what kind of remedial education (or special psychological interventions) should be enacted.

5.2 Effective document management

The documents of assessment outcomes (i.e. the Report on School Readiness or any other document resulting from a combination and comparison of various profiles or competences) could be saved in various formats, stored, printed and exported. Any other requirements of an efficient document management should be matched.

5.3 To offer a multi-method and multi-informant integration

There is a need to: (1) reduce the possibility of the artifact occurring when one uses only a type of measure for competence or/and from a single perspective, and (2) collect as much relevant information as possible from trustworthy informants.
Thus, the platform will contain several instruments for the same competence and three types of informants or assessors: the psychologist, the teacher and the parent, each using an appropriate assessment tool. The assessment outcomes will be presented under the label of each competence, so that one can see which information is provided by all tools and informants and which one is covered only by one or another instrument/informant. Thus, it can circumscribe the most reliable information by mutual corroboration of the existent data and draw adequate conclusions.

5.4 Longitudinal assessment

The platform will store and integrate iterative evaluations of the same competence. For example, the assessment outcomes of a child at the age of 3, 4 or 5 will be collected in a database and processed so that one can have on the display not only the discrete results for each evaluation but also the longitudinal trend in a graphic format. As it is known, the same result has one meaning if it is considered as a punctual outcome and another meaning when it is imbedded in a longitudinal tendency. A low attention performance at 5 years of age could, however, be a good sign if compared with an even lower performance at 4 and much lower at 3 years. The platform allows us to extract much more information from the same data.

5.5 Advanced data processing

The platform should allow an advanced computational and/or statistical analysis of the assessment data. For example, it must offer the possibility to compare the assessment outcome of children belonging to families with various economic, social or cultural backgrounds, the impact of different curricula, the adequate or non-adequate character of specific learning standards, regression analyses, etc. The advanced data processing is an important requirement for any sound political measure or educational intervention. The same amount of data spread in insulated databases may produce rather a puzzling effect than a coherent approach and implementation plan.

5.6 Continuous upgrading

The platform should allow any upgrading of the assessment tools and documents; any time one can upgrade the norms of the tests or the documents format, add new assessing instruments or upgrading versions of those already existent. The upgradation or new versions of the platform should be user-friendly.

5.7 Restricted access

Some of the information stored on the platform may be misused. To prevent such issues, the access to the assessment outcomes will be limited, according to the user's qualification level. For example, a teacher will not be allowed to use the data obtained by using standardized psychological tests.

To conclude, a computerized platform for assessment of school readiness, covering assessment outcomes about cognitive, socio-emotional competences and temperament/personality characteristics and satisfying the constraints mentioned above may offer a substantial added value. It will proceed to a multi-methods, multi-informants integration and will allow a much better exploitation of the assessment data than before. The time is ripe now to construct such a platform.

6 The Framework

6.1 Method of the framework

Examinees

The sample will include around 200 kindergarten children who, according to their chronological age, are supposed to enter the first grade in the coming school year. The tracking of these children will take place between the end of the school year (April) in the kindergarten until their first year in the first

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

grade. Of the 200 children of the sample, 186 were promoted to the first grade, 9 children were promoted to the first grade and were allotted special support, and 5 were held back for an additional year in kindergarten.

6.2 Assessing readiness for school

Kindergarten teacher's evaluation questionnaire, based on the Ministry of Education's Questionnaire ("Questionnaire for the identification of special needs", Director General's Circular (March 2000)). In order to meet the needs of the study, the questionnaire underwent accommodation. The questionnaire includes two parts; the **first part** includes questions that examine the kindergarten teacher's evaluation regarding the kindergarten child's level of functioning in the cognitive, verbal, motor, behavioural-emotional and motivational fields. The questions are worded for the *Likert scale*, every question has 5 possible answers: 1- "No problem" to 5-"Very serious problem". The **second part** includes questions that examine the kindergarten teacher's assessment regarding the child's success in the first grade, in the following fields: Reading, writing, arithmetic and the behavioural-emotional field. In this section too, the questions are worded for the Likert scale, every question has 5 possible answers: 1-"Very high chance of success" to 5-"Low chance of success". Additionally, this part of the questionnaire asks for the kindergarten teacher's recommendation regarding the suitable educational framework for the following academic year (first grade in regular education, special education or being held back in compulsory kindergarten). The questionnaire gives a subjective picture of the kindergarten teacher's assessment of the child's readiness for school (see appendix 1).

6.3 Computerized assessment of readiness for school

The computerized assessment of readiness for school is designed to assess and develop the user's various learning skills in the course of the game. The wide variety of games covers different areas of cognitive skill, knowledge and skill. Using advanced multimedia tools. The diagnostic battery enables an evaluation of the child's level of functioning in a number of developmental areas: Comprehension of quantity and mathematical understanding, memory, visual comprehension, auditory comprehension, visual-motor functioning and language functions.

The evaluation can be run for a long period of time without the instructor's intervention. The evaluation engine collects data on the user, while the games are being run. The system allows for a report to be delivered to the instructor at the end of the activity period. The computerized system is comprised of seven activities: the magic circles, the shadow, analogies, triangles, ordering pictures, identifying faces, and arithmetic (for a detailed description of each of the activities, see appendix 5). The timeframe for going through the entire computerized system ranges between 45-60 minutes. The first activity with which each child begins is "find the red square", the child is required to click on all of the squares appearing on the screen and to find the red square, the other squares on the screen being blue. The goal of this activity is to train the child to use the mouse. On the bottom and left sides of the screen, there is a toolbar that includes a number of buttons meant to help the child work independently. On each of the buttons, a picture is drawn that is meant to explain the reason for its appearance on the screen. The activities have things in common: 1- For every activity, a verbal instruction is played in the spoken Arabic language, where the option of hearing the instruction an additional time is given to the child by pressing a certain button on which a speaker is drawn. 2- In each activity, there are a number of items that the child goes through on a rising level of difficulty. 3- Before the child begins the activity, he is given a demonstration with the option of an additional demonstration in case the child needs one by pressing on a button. 4- The activity only begins after the child has heard the instruction, seen a demonstration and pressed a button on which a traffic light is drawn, the moment that the child presses the button, the traffic light turns green and the activity begins. 5- During the diagnostic activity (whose purpose is evaluation, as opposed to the demonstration at the beginning of the activity), an hourglass appears on the screen meant to illustrate to the child that he is in a situation in which time is important. 6- After the time allocated for the activity ends, the activity ends and the computer solves the last item that appeared to the child. 7- For every correct response, the child receives positive feedback, as opposed to an incorrect response for which the child receives no feedback, but rather the game simply continues. 8- On the main screen of the system, there are two pictures, of which one of them is a small girl playing on a computer, the child must click on the picture of the girl in order to enter the system, the second screen includes pictures of the kindergarten students, and he must click on his personal picture in order to begin playing or to continue from the point that he left off at the last time. 9- If the child needs help, the child must press a question mark in order to receive help.

6.4 The technological infrastructure of the games

The games are based on Microsoft Corporation's Windows operating system. The games are based on a framework of objects that were specially developed in order to make the modular use of the system's tools easier. The system supports graphic designs, vocal communication, touch-screen and more. The games are tailored for various levels of difficult and levels of instruction in order to examine and develop specific abilities of the user, according to a number of parameters. The infrastructure of the games supports several languages. Thus the interface's language can be adapted for the user.

6.5 Achievement exams upon completion of the first grade

The children who were found to be prepared and entered first grade underwent achievement tests in reading, reading comprehension, writing and arithmetic. These exams were struc-

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

tured according to the school's curriculum, after consultation with the first grade teachers regarding the content and the exam's structure; this is meant to achieve a uniform version for all of the sample's children from the various schools. This version serves as a grade-wide test that examines all of the skills and contents, despite the differences in teaching methods, the amount of material that the teachers managed to complete, etc. (See appendix 6 and appendix 2).

6.6 The guidelines

An application to receive approval for the study was submitted to the Education Ministry's offices in the Haifa and Northern districts. After receiving the approvals, At the same time, an explanation form was sent to the parents, including a form certifying approval for their child's participation in the study (See Appendix 3). For parents who approve their child's participation, the child undergoes a series of computerized neurocognitive examinations to evaluate the cognitive functioning. Following that, the first-grade readiness questionnaires prepared by the kindergarten teachers are collected. The results of the cognitive identification battery will be *confidential* and will not, in any way, influence the normal process splitting the kindergarten students into two groups. The students found ready and promoted to the first grade underwent achievements tests in reading, writing and arithmetic. These examinations were structured in accordance with the school's curriculum.

6.7 Processing the data

The selection was held separately for children delayed enrolment in the first grade, for children integrated in the special education system and for children integrated in the first grade in the public school system. The main goal of the testing of this diagnostic battery is to evaluate the achievements of the third group at the conclusion of third grade in keeping with the predictors of the computerized tests done the year before. Although the numerical size of this group is unknown, on the basis of past data, one can predict that this group will include 80%-85% of the overall kindergarten children in the initial sample. In order to evaluate the validity and the benefit of the proposed battery, the teachers' evaluations and the results of the achievement tests will be checked: In reading, writing and arithmetic- that will be adapted for this study. These data, to be received toward the end of the first grade, will serve as the criteria test of the predictive ability of the battery. Beyond examining the links between expectations and actual achievements, the computerized system's predictors of failure in school are compared to the evaluations of the kindergarten teachers, the psychological services and the tests utilized to predict the children's potential for success or failure given toward the end of the kindergarten year. In the event that there are children who are not promoted to first grade or who are referred to special education, they will be identified at the conclusion of the kindergarten year and the outcomes of the computerized tests for this group will be examined.

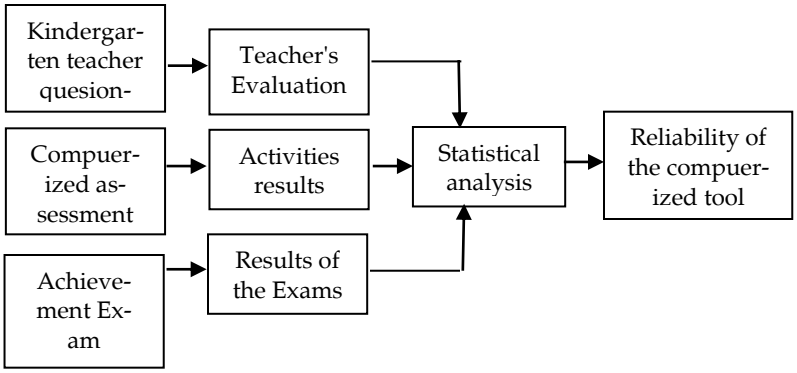


Figure 1- **Checking the reliability of the Computerized Tool**

7 The Reliability of the Computerized School Readiness Tool

7.1 Participants

184 children were included in the study, 85 (46.2%) boys and 99 (53.8%) girls. All statistical procedures that were applied require at least 30 subjects in each cell/each measurement (n=30). Hence, n=184 is sufficient for all the statistical analysis.

7.2 Results (Means and Standards Deviations for the computerized tool)

	Mean	Standard Deviation
Computer program (CP) Assessment (T1)		
Balloon Counting	46.9	49.25
Balloons numbers	46.9	49.25
Choose the Form	9.4	27.24
Click the…	40.2	48.04
Counting and numbers	1.3	5.90
Faces	22.8	31.91
Incomplete Shadow	38.4	39.17
Magic Circle	36.6	36.46
More or Less	44.7	48.00
Remember Location	45.0	47.57
Set order	18.4	30.22
Preschool's teacher (PT) evaluation (T1)		
Motivation	4.4	0.78
Behaviour	4.4	0.57
Language and cognitive skills	4.7	0.60
Participation in activities	4.7	0.55
Motor skills	4.8	0.45
Chances of success in school	4.2	0.80
First grade achievements (T2)		
Arithmetic	91.4	10.26
Reading	89.5	16.43
Dictation	88.4	20.36
Exercise	89.7	14.48

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

Understanding	89.5	17.73
Analogy	94.2	8.19

Table 1- **Means and Standards Deviations for computer assessment, preschool's teacher evaluation and first grade achievements**

As can be seen from Table 1 above, PT evaluations are rather high with means ranging from 4.2 to 4.8 (on a scale of 1 to 5, with 5 indicating the highest evaluation).

First Year scores were also on the high side, with means ranging from 88.4 to 94.2 (on a scale of 1 to 100, 100 indicating the highest knowledge).
Preschool teachers were asked to report on the child suitability to advancing to the first grade. As can be seen from Table 24 and Figure 13, PT found 90.2% of the children as being suitable for advancing to the first grade. 6% children were evaluated as being best referred to a special education class and the remaining 3.8% were evaluated by PT as suitable for remaining another year in preschool (PS).

	N	%
Advance to 1st grade	166	90.2
Referred to special education	11	6.0
Remain another year in PS	7	3.8
Total	184	100.0

Table 2- **Preschool's Teacher recommendations'**

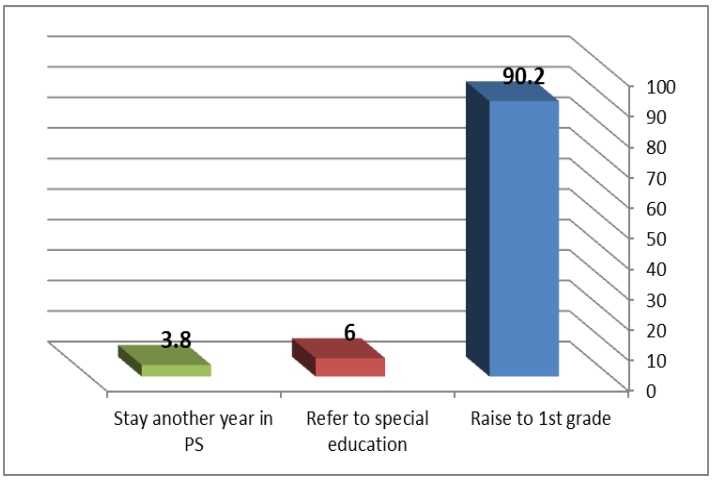


Figure 2- Distribution of Preschool's Teacher recommendations'

Due to the small number of children in the second and third categories these two categories were combined in order to make statistical Inferences possible.

7.3 Relationships between the three measures

To start evaluating the correlations between PT assessments of the children at T1 and the children's achievements on the computer program, at the same time. Table 2- presents the correlations between the two measures.

	Arithmetic	Reading	Dictation	Exercise	Understanding	Analogy
1	.093	.072	-.069	-.091	.105	.208**
2	.093	.072	-.069	-.091	.105	.208**
3	.057	.090	-.025	.015	.027	.089
4	.118	.103	-.058	-.042	.135	.110
5	-.050	-.159*	-.016	-.050	.072	-.064
6	.027	.137	-.001	-.025	.088	.126
7	.090	.092	-.024	-.040	.122	.146*
8	.034	.118	-.055	-.090	.132	.130
9	.090	.087	-.074	-.081	.156*	.173*
10	.118	.133	.009	-.029	.187*	.190**
11	.045	.151*	-.012	-.001	.133	.134
12	.001	.011	-.078	-.088	.054	.059

**p<.05; **p<.01*

1-Balloon Counting, 2-Balloons numbers, 3- Choose the Form
4- Click the…, 5-Counting and No., 6- Faces, 7- Incomplete Shadow
8-Magic Circle, 9-More or Less, 10-Remember Location
11-Set order, 12-Triangles

Table 3- **Pearson's correlations between PT assessment and Computer Program achievements**

Pearson's correlation coefficient is used in order to test dependence between two continuous variables. In the present study Pearson correlations were calculated in order to examine the relations between two continuous variables e.g.: Teachers evaluation and performance on the computerized program.
As can be seen in Table 4, positive significant correlations were found between the PS evaluation of the child's Motor skills and their performance in some of the computer measures. These correlations indicate that better Motor abilities are associated with better performance in the computer program. Significant positive correlations were also found between 'participation in activities' and two of the computer program activities. (PS and CP) in T1 with achievements in T2.
In order to examine the relationships between PS's teacher assessments and 1st grade achievements, Pearson correlations were calculated. Correlations are presented in Table 3.

	Arithmetic	Reading	Dictation	Exercise	Understanding	Analogy
1	.494**	.507**	.601**	.539**	.522**	.025
2	.315*	.422**	.431**	.302*	.222	.060
3	.460**	.642**	.395**	.401**	.386**	.057
4	.128	.407**	.333**	.405**	.366**	.035
5	.506**	.613**	.439**	.531**	.536**	.159
6	.435**	.522**	.446**	.350**	.352**	.006

**p<.05; **p<.01; **p<.001*

1-Motivation, 2-Behaviour, 3-Language and cognitive skills
4-Participation in activities, 5-Motor skills, 6-Chances of success in school

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

Table 4- **Pearson correlations between PS's teacher assessments and 1st grade achievements**

As can be seen in Table 3, positive significant correlations were found between most of the PS teacher assessments to the 1st grade achievements. PS teacher assessments measured in the preschool - regarding child's motivation, behaviour, language and cognitive skills, motor skills and chances of success in school correlated positively with all 1st grade score except 'Analogy'.

Table 4 presents correlations between correlations between CP Assessment Scores and 1st grade achievements.

	Arithmetic	Reading	Dictation	Exercise	Understanding	Analogy
1	-.164	-.203	-.181	-.078	-.142	.107
2	-.164	-.203	-.181	-.078	-.142	.107
3	.037	.092	.077	.090	.099	.116
4	-.160	-.307*	-.003	-.096	-.119	-.123
5	.578**	.535**	.432**	-.282*	-.463**	-.100
6	.008	-.063	-.179	-.144	-.094	.069
7	-.087	-.137	-.159	-.089	-.059	-.040
8	-.172	-.161	-.232	-.096	-.118	.161
9	-.074	-.088	-.004	-.068	-.078	.140
10	-.128	-.070	-.214	-.004	-.063	.171
11	-.040	-.073	-.184	-.154	-.143	.122
12	-.273*	-.222	-.237	-.145	-.110	-.277**

*$p<.05$; **$p<.01$

1-Balloon Counting, 2-Balloons numbers, 3- Choose the Form
4- Click the…, 5-Counting and No., 6- Faces, 7- Incomplete Shadow
8-Magic Circle, 9-More or Less, 10-Remember Location
11-Set order, 12-Triangles

Table 5- **Pearson correlations between CP Assessment Scores and 1st grade achievements**

As can be seen in Table 7, no positive correlations were found between the CP (computer program) assessment and the 1st year achievements. On the contrary, some negative significant correlations were found between some of the subscales of the two measures.

In order to examine the validity of the PS recommendations for the child (Advance to 1st grade vs. Remain or refer to special education), 1st grade scores between the two groups have to be compared.

Comparisons were conducted *using T-test for independent measures*. Results are presented in Table 5 and in Figure 3.

T-test for independent measures is being used in order to compare between two independent groups in one continuous variable. In the current study t-test was used in order to compare performance of students from two independent groups (stay in KG vs. Pass to 1st grade).

	PS recommendation				
	Mean	Standard Deviation	Mean	Standard Deviation	t
1	83.7	15.90	92.0	9.57	1.764
2	63.0	29.89	91.7	12.96	4.213*
3	75.4	34.14	89.5	18.84	1.503
4	75.8	42.49	90.9	9.35	2.305*
5	75.3	42.66	90.7	14.11	1.895*
6	94.3	10.99	94.2	7.78	0.044

*$p<.05$
1-Arithmetic, 2-Reading, 3-Dictation
4-Exercise, 5-Understanding, 6-Analogy

Table 6- **Means and SD for 1st grade scores**

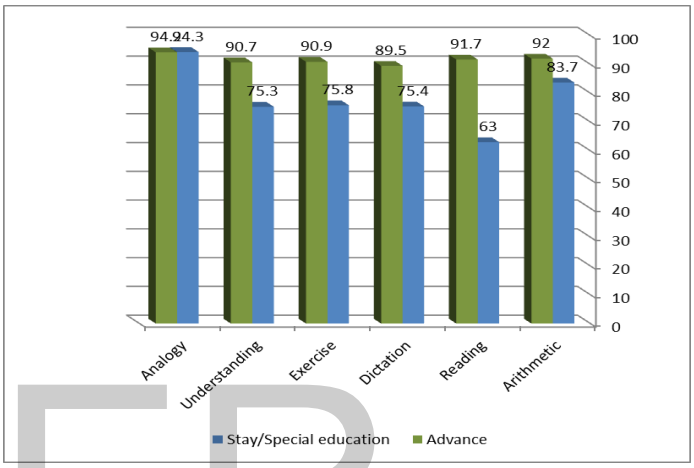


Figure 3- **Means and SD for 1st grade scores**

As can be seen in the table and in the corresponding graph, children who were evaluated by their PT as being suitable for advancing to the 1st grade achieved better grades then children who were assessed as not being ready for the 1st grade. The differences between the two groups were significant for 'Understanding' and 'Reading'.

Finally, in order to examine which measures best predict the children's performance in 1st grade a Hierarchic regression analysis was conducted. Hierarchic regression analysis is used in order to predict the relative contribution of each independent variable to the explanation of the predicted variable. In this study hierarchic regression was used to examine how performance in different areas while in KG predicts students' performance in 1st grade. Predicted variables were an overall mean of 1st grade scores. As predicting variables all PS evaluations of the child (Motivation, Behaviour, Language and cognitive skills, Participation in activities, Participation in activities and Chances of success in school) were entered (computer program's scores were not entered, due to lack of significant correlations with the predicted variable). Findings are presented in Table 29.

	PS recommendation				
	B	**Std. Error**	**Beta**	**t**	**Sig.**
1	6.794	2.572	.426	2.642	.011
2	-.527	2.810	-.029	-.188	.852

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

3	2.250	4.321	.121	.521	.605
4	-.218	3.047	-.014	-.071	.943
5	-.906	2.875	-.040	-.315	.754
6	8.154	3.870	.327	2.107	.040
7	-1.756	6.684	-.041	-.263	.794

*$p<.05$

1-Motivation, 2-Behaviour, 3-Language and cognitive skills

4-Chances of success in school, 5-Participation in activities, 6-Motor skills

7- PT recommendation

Table 7- **Hierarchic regression analysis predicting 1st grade achievements**

The regression model was found to be significant ($F(7,64)=7.808$, $p<0.001$), explaining 42.7% of the variance in 1st grade achievements. As can be seen in the table 26, the child's motivations and Motor skills, as evaluated by the PT were significant in predicting 1st grade achievements.

7.3 Summary of Findings

- No relationship was found between PT's evaluation and CP achievements.
- Correlations were found between PT's evaluation in T1 and child's achievements at T2 .
- PT's recommendation regarding remaining in the preschool or moving to a special educational framework was found to be valid: Children for whom such a recommendation was made, (but not implemented) showed lower achievements at the end of first grade than their peers.
- The regression model found that of all the variables in the teacher evaluation, the variables that predicts clearest and best achievements of the student's grade, are the child degree of motivation and their motor skills.

8 Conclusions

Statistics—the science of learning from data, and of measuring, controlling, and communicating uncertainty—is the most mature of the data sciences. Over the last two centuries, and particularly the last 30 years with the ability to do large-scale computing, this discipline has been an essential part of the social, natural, biomedical, and physical sciences, engineering, and business analytics, among others. Statistical thinking not only helps make scientific discoveries, but it quantifies the reliability, reproducibility and general uncertainty associated with these discoveries. Because one can easily be fooled by complicated biases and patterns arising by chance, and because statistics has matured around making discoveries from data, statistical thinking will be integral to Big Data challenges. Rudin et al. (2014)

The Computerized program, designed so as to improve predictions of child's achievements in school, showed low reliability. It did not correlate with PT assessments nor did it predict the child's achievements in school.

It should be noted that the PT assessments are also not free of mistakes, and have limited predictive power. The use of a computerized assessment tool looks like an innovative way to assess a child's readiness to first grade, overcoming the preschool teacher biases and misconceptions of the child. However, the computerized tool needs to be improved in order to include additional skills that are more relevant to the 1st grade students.

This analysis is intended to allow:

1. Definition of the appropriate weights for each of the measured parameters in each test.
2. Definition of a differential (adaptive) profile that predicts specific difficulties in first grade studies, or predicting general failure in first grade.

On the basis of these profiles and the theoretical background regarding the meaning of success / failure in these parameters, a group with high risk to fail in first grade will be defined out of the complete testing pool. As the actual results of first grade performance of the students is gathered, another correction / validation process will be done.

Information-communication technology (ICT) offers so many outstanding possibilities for teaching and learning that its application has been growing steadily in every segment of education. Within the general trends of the utilization of ICT in education, technology-based assessment (TBA) represents a rapidly increasing share. Several traditional assessment processes can be carried out more efficiently by means of computers. In addition, technology offers new assessment methods that cannot be otherwise realized. It is without doubt that TBA will replace paper-based testing in most of the traditional assessment scenarios, and technology will further extend the territories of assessment in education, as it provides frequent and precise feedback for the participants in learning and teaching that cannot be achieved by any other means.

A variety of web-based adaptive assessment models have been proposed as alternatives to the assessing pre-school children, the next chapter will describe a model of an adaptive web-based assessment for School Readiness.

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

REFERENCES

[1] Blair, C. (2002). School readiness. Integrating cognition and emotion in a neurobiological conceptualization of children functioning at school entry. *American Psychologist*, Vol. 57, No. 2, pp. 111-127.

[2] Carlton, M. P., & Winsler, A. (1999). School readiness: The need for a paradigm shift. *School Psychology Review*, Vol. 28, No. 3, pp. 338-352.

[3] Carlton, M. P. (1999). Motivation and school readiness in kindergarten children. *Dissertation Abstracts International*, Vol. 60, No. 11-A, 3899A.

[4] Cicchetti, D. & Toth, S. L. (1997). Transactional ecological systems in developmental psychopathology. In. Luthar, S. S, Burack, J. A. Cicchetti, D., & Weiss, J. R. (Eds.)

[5] Crick, N., & Dodge, K. A. (1994). A review and reformulation of social-information processing mechanisms in children's social adjustment. *Psychological Bulletin*, Vol. 115, pp. 74-101.

[6] Dede, C. (2005). Planning for Neomillennial Learning Styles. *EDUCAUSE Quarterly* 28, No. 1, pp. 7–12.

[7] Denham, S. (2005). Assessing social-emotional competences in children from a longitudinal perspective. Prepared for the *National Children's Study*, Contract no. 282-98-0019.

[8] Denham, S. (2006). Social-emotional competence as a support for school readiness: what is it and how to assess it? *Early Education Development*, Vol. 17, No. 1, pp. 57-89.

[9] DiCerbo, K., & Behrens, J. (2012). Implications of the Digital Ocean on Current and Future Assessment. In Computers and Their Impact on State Assessment: Recent History and Predictions for the Future, ed. R. Lissitz and H. Jiao, pp. 273–306. Charlotte, NC: Information Age Publishing.

[10] Dodge, K., Laird, R., Lochman, J., Zelli, A. & Conduct Problems Prevention Research Group, (2002). Multidimensional latent-construct analysis of children's social information processing patters: Correlations with aggressive behavior problems. *Psychological Assessment*, Vol. 14, pp. 60-73.

[11] Friedman, T. (2005). *The World Is Flat: A Brief History of the Globalized World in the Twenty-First Century*. London: Allen Lane.

[12] Ionescu, T., & Benga, O. (2007). Reconceptualizing Early Education on Scientific Grounds: School Readiness in Focus. *Cognition, Brain, Behavior*, Vol. 11, No. 1, pp. 49-66.

[13] Ito, M., Baumer, S., Bittanti, D., Boyd, R., Cody, B., Herr-Stephenson, H. A., Horst, P. G., Lange, D., Mahendran, K. Martinez, C. J., Pascoe, D., Perkel, L., Robinson, C., & Tripp, L. (2010). *Hanging Out, Messing Around, and Geeking Out: Kids Living and Learning with New Media*. Cambridge, MA: MIT Press.

[14] Izard, C. E., Fine, S., Schultz, D., Mostow, A., Ackerman, B., & Youngstrom, E. (2001). Emotions knowledge as a predictor of social behavior and academic competence in children at risk. *Psychological Science*, Vol. 12, pp. 18-23.

[15] Kellaghan, T., & Madaus, G. F. (1991). National Testing: Lessons for America from Europe. *Educational Leadership,* Vol. 49, No. 3, pp. 87–93.

[16] Kliebard, H. (1987). *The Struggle for the American Curriculum*, pp. 1893–1958. New York: Routledge and Kegan Paul.

[17] Kochenderfer, B. J., & Ladd, G. W. (1996). Peer victimization: Cause or consequence of school maladjustment? *Child Development*, Vol. 67, pp. 1305-1317.

[18] Lemerise, E. A., & Arsenio, W. F. (2000). An integrated model of emotion processes and cognition in social information processing. *Child Development*, Vol. 71, pp. 107-118.

[19] Lenhart, A., Kahne, J., Middaugh, E., Macgill, A. R., Evans, C., & Vitak. J. (2008). Teens' Gaming Experiences Are Diverse and Include Significant SocialInteraction and Civic Engagement. Washington, DC: Pew Internet and American Life Project.

[20] Madaus, G., & O'Dwyer, L. (1999). A Short History of Performance Assessment. *Phi Delta Kappan*, Vol. 80, No. 9, pp. 688–695.

[21] Miclea, Mircea, Mihalca, & Loredana. (2007). A Computerized Platform for Assessment of School Readiness. *Cognition, Brain, Behavior,* Vol. 11, No. 1, pp. 83 – 90.

[22] Noftle, E. E., & Robins, R. W. (2007). Personality Predictors of Academic Outcomes: Big Five Correlates of GPA and SAT Scores. *Journal of Personality and Social Psychology*, Vol. 93, pp. 116–130.

[23] O'Connor, M., & Paunonen, S. (2007). Big Five Personality Predictors of Post-secondary Academic Performance. *Personality and Individual Differences*, Vol. 43, pp. 971–990.

[24] Poropat, A. E. (2009). A Meta-analysis of the Five-Factor Model of Personality and Academic Performance. *Psychological Bulletin*, Vol. 135, pp. 322–338.

[25] Quellmalz, E. S., Timms, M. J., Buckley B. C., Silberglitt, M., & Brenner, D. (2012). *SimScientists: Measurement in Simulation-Based Science Assessments*. Unpublished manuscript.

[26] Raver, C. C., & Knitzer, J. (2002). *Ready to enter: What research tells policymakers about strategies to promote social and emotional school readiness among three- and four years-old*. New York: National Center for Children in Poverty.

[27] Robins, L. N., & Rutter, M. (1990). *Straight and devious pathways from childhood to adulthood*. Cambridge, England: Cambridge University Press.

[28] Shepard, L. A. (1991). Will National Tests Improve Student Learning? Phi Delta Kappan 72:232–238. Available at: http://www.cse.ucla.edu/products/Reports/TECH342.pdf.

[29] Shute, V. J. (2011). Stealth assessment in computer-based games to support learning. In S. Tobias, & J.

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

D. Fletcher (Eds.), *Computer games and instruction* (pp. 503-524). Charlotte, NC: Information Age Publishers.

[30] Shute, V. J. (2007). Tensions, Trends, Tools, and Technologies: Time for an Educational Sea Change. In The Future of Assessment: Shaping Teaching and Learning, ed. C. A. Dwyer, pp. 139–187. New York: Erlbaum.

[31] Shute, V. J. (2009). Simply Assessment. *International Journal of Learning and Media*, Vol. 1, No. 2, pp. 1–11.

[32] Shute, V. J., & F. Ke. (2012). *Games, Learning, and Assessment. In Assessment in Game-Based Learning: Foundations, Innovations, and Perspectives*, ed. D. Ifenthaler, D. Eseryel, and X. Ge, pp. 43–58. New York: Springer.

[33] Shute, V. J., & Torres. R. (2012). *Where Streams Converge: Using Evidence-Centered Design to Assess Quest to Learn. In Technology-Based Assessments for Twenty-First-Century Skills: Theoretical and Practical Implications from Modern Research*, ed. M. Mayrath, J. Clarke-Midura, and D. H. Robinson, pp. 91–124. Charlotte, NC: Information Age Publishing.

[34] Shute, V. J., & Kim, Y. J. (2011). Does playing the World of Goo facilitate learning? In D. Y. Dai (Ed.), Design research on learning and thinking in educational settings: Enhancing intellectual growth and functioning (pp. 359-387). New York, NY: Routledge Books.

[35] Shute, V. J., & Torres, R. (2011). Where streams converge: Using evidence-centered design to assess Quest to Learn. In M. Mayrath, J. Clarke-Midura, & D. H. Robinson (Eds.). Technology-based assessments for 21st Century skills: Theoretical and practical implications from modern research (pp. 91-124). Charlotte, NC: Information Age Publishing.

[36] Sternberg, R. J. (2006). The Nature of Creativity. *Creativity Research Journal,* Vol. 18, No. 1, pp. 87–98.

[37] Tobias, S., & Fletcher, J. D. eds. (2011). *Computer Games and Instruction*. Charlotte, NC: Information Age Publishers.

[38] Tobias, S., Fletcher, J. D., Dai, D. Y., & Wind, A. P. (2011). Review of Research on Computer Games. In Computer Games and Instruction, ed. S. Tobias and J. D. Fletcher, pp. 127–222. Charlotte, NC: Information Age.

[39] Trapmann, S., Hell, B., Hirn, J. W., & Schuler, H. (2007). Meta-analysis of the Relationship between the Big Five and Academic Success at University. *Journal of Psychology,* Vol. 215, pp. 132–151.

[40] Trilling, B., & Fadel, C. (2009). *Twenty-First-Century Skills: Learning for Life in Our Times*. San Francisco: Jossey-Bass.

[41] Walberg, H. J., & Stariha, W. E. (1992). Productive Human Capital: Learning, Creativity, and Eminence. *Creativity Research Journal,* Vol. 5, pp. 323–340.

[42] Wayne, C. M., Fantuzzo, J. W., & McDermott, P. A., (2004). Preschool competences in context: an investigation of the unique contribution of the child competences to early academic success. *Developmental Psychology*, Vol. 40, No. 4, pp. 633-645.

[43] Wilson, K. A., Bedwell, W., Lazzara, E. H., Salas, E., Burke, C. S., Estock, J., & Conkey, C. (2009). Relationships between Game Attributes and Learning Outcomes: Review and Research Proposals. *Simulation and Gaming*, Vol. 40, No. 2, pp. 217–266.

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

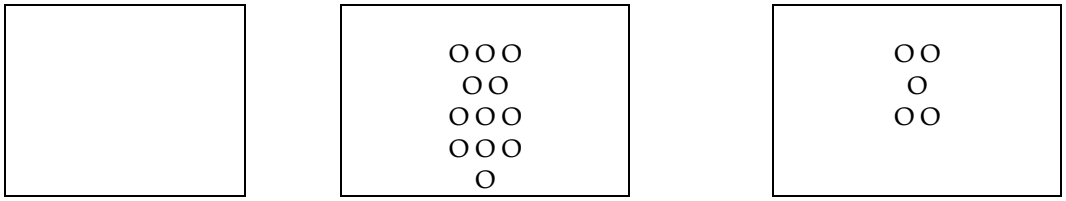
Appendix 1: Arithmetic Exam

Class A

Date: _____

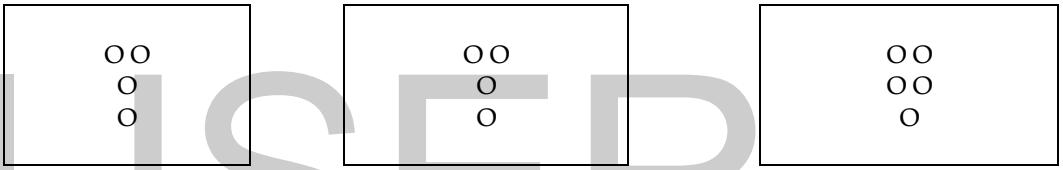
Name:_____

1.1. Count the Number of circles



_____ _____ _____

1.2. Complete drawing circles until the number below



6 **13** **10**

1.3. Complete the sequence

6	7	8	__	__	__	__	13
12	__	__	__	__	__	18	19
20	30	40	__	__	40	30	90

1.4. Write the numbers

Eleven	_____
Eight	_____
Five	_____
Sixty	_____

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

1.5. Solve the below exercises

3 + 8	= ___	5 + 4	= ___
17 – 13	= ___	10 + 4	= ___
8 – 0	= ___	19 + 0	= ___
11 – 9	= ___	15 - 5	= ___
3 + 14	= ___	20 - 2	= ___
10 – 8 – 2	= ___	5 + 4 + 2	= ___
20 – ___	= 11	10 + ___	= 13

1.6. Put the signal "< "Or" > "Or"=" inside the square

17 - 5		3 + 14
19		14
9		10 - 1

1.7. Arithmetic question-1

Sitting on the bus 15 passengers, came down in the station 9 passengers. How many passengers stayed on the bus?_____

1.8. Arithmetic question-2

Baha has 5 marbles and Sami has 7 marbles. How many marbles with both?_____

1.9. Draw a circle on the even number

5	**7**	**11**	**2**
18	**10**	**6**	**19**

*1.10. Analyze to tens and ones**?***

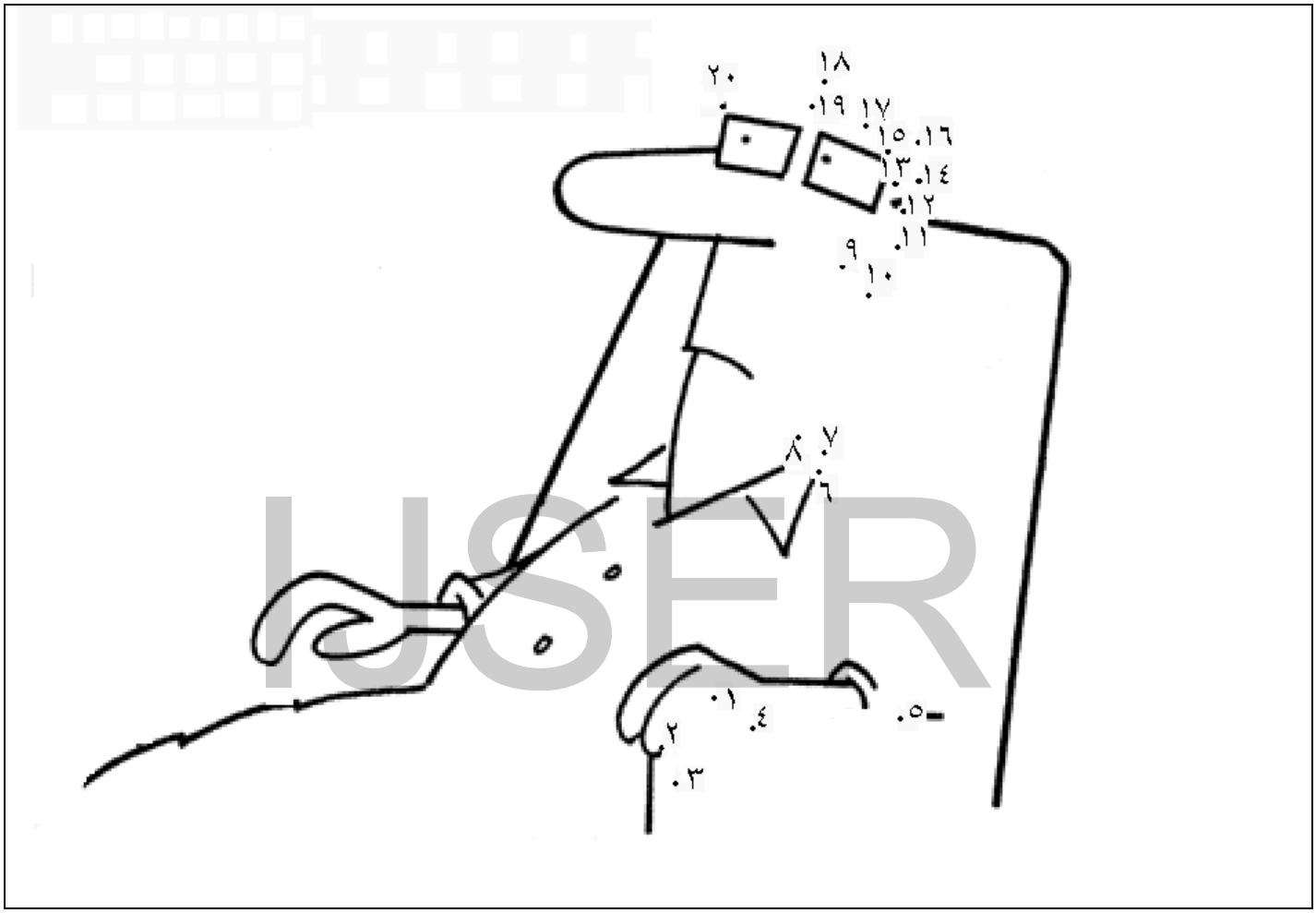
40 = _____ Tens
60 = _____ Tens
2 Tens = _____
1 Tens = _____

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

1.11. Sort the following numbers from smallest to largest

17	20	9	14	3	8

1.12. Connect the numbers in order, and I get a pretty picture

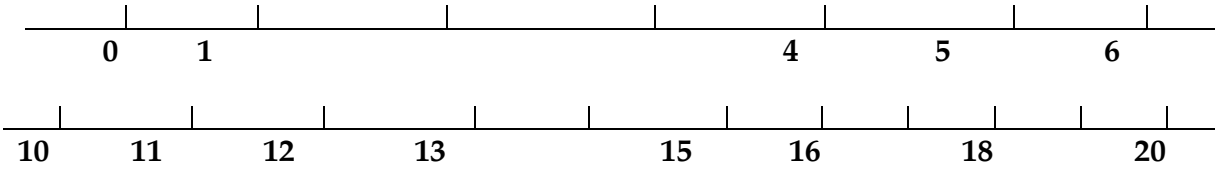


1.13. Connect between the exercise and the correct answer

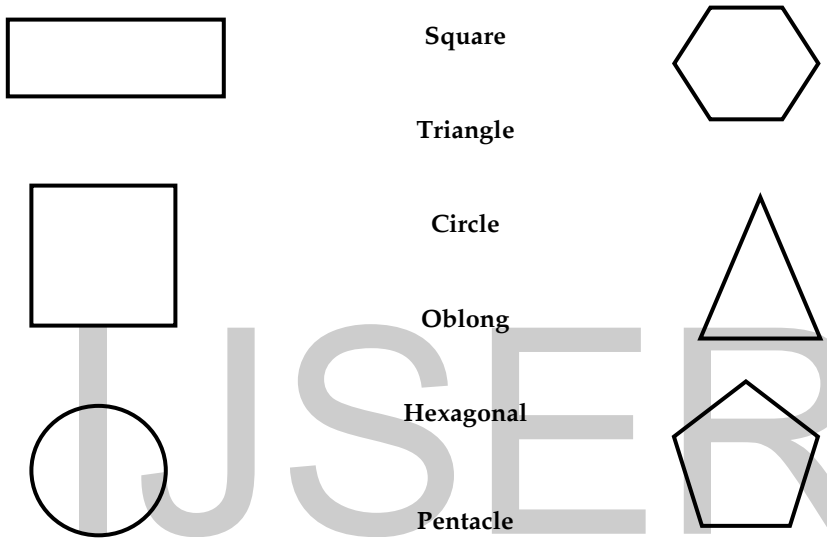
70 – 20 =	70	90 – 60 =	50
80 – 10 =	50	50 + 20 =	30
30 + 40 =	30	20 + 30 =	70

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

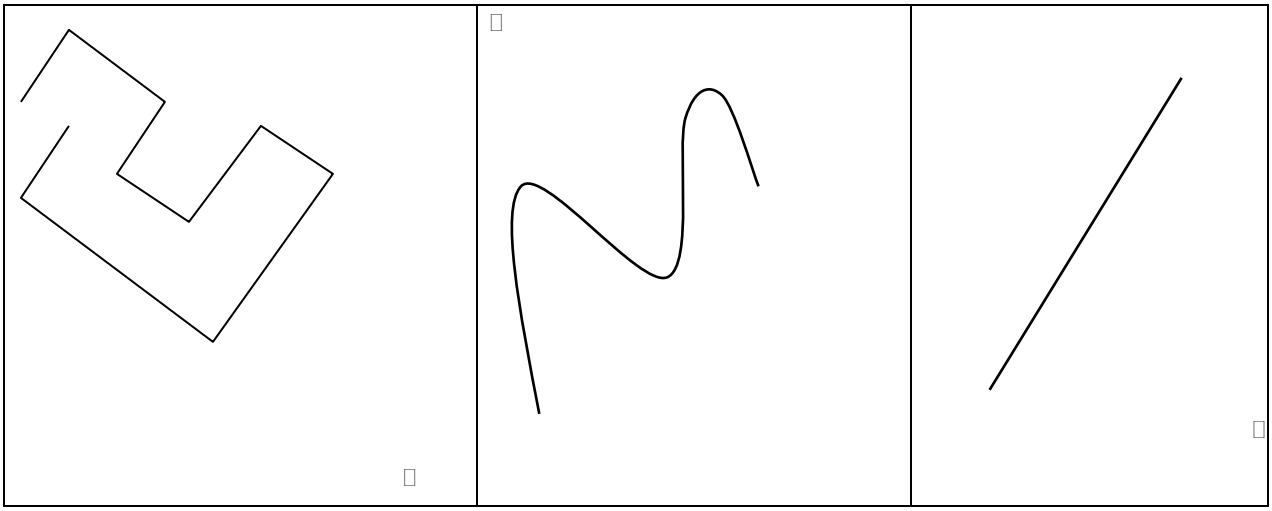
1.14. Complete the straight numbers



1.15. Draw a line between form and name



1.16. Put X in the broken line. O on the straight line. on the curved line.



International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

Appendix 2: Arabic Exam

Class A

Date:_____

Name:_____

2.1 Reading comprehension

Samir went on a visit to his uncle's farm. Samir saw many trees. Samir asked his uncle: "Do you irrigate the trees, O my uncle?", His uncle said to him: "We irrigate the tree when it small, and when it grows up the rain will irrigate it"

Complete the sentences of the store words:

1. Samir went to visit _____ farm.
2. In the Farm, Samir saw _____ trees
3. Samir asked his uncle: "Who is irrigating the _____"?

(Many, Uncle's Farm, Trees)

2.2 Answer the following questions:

1. Where Samir did went? _____ .
2. What did he saw in the farm? Samir Saw _____ _____ .
3. Who is irrigating the trees when it grows up?
   _____ ____ irrigating the trees when it grows up.

2.3 Complete the missing

Plural	Single
Trees	_____
_____	Farm
_____	Boy

2.4 Complete the missing

Word	Opposite
Small	_____
Asked	_____
Many	_____

(Answered, Little, Big)

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

2.5 Complete the missing (*)

He	She
Asked	_____
_____	Said
Went	_____
_____	Saw

* In Arabic language there a different between the form of he and she.

2.6 Tick (√) or (×)

1. Samir went on a visit to his uncle's farm. _____
2. Samir saw many trees _____
3. When the trees grows up the rain will irrigate it _____

2.7 Sort words scattered among other useful component

His uncle, Samir, visited .1

_____

Samir , His uncle, asked .2

_____

2.8 Enter the following words in the useful phrase

Visited _____

Trees _____

2.9 Decompose the word:

رَ – باب =	_____
دَ – جا – جَة =	_____
صُنْـ - ـدو – قٌ =	_____
ثُـ - فا – ح =	_____
شَـ - بَـ - ـكَـ - ـتِـ - ـهِ	_____
فَـ - رَ – ساً =	_____
أنْـ – وابْ =	_____

2.10 Cut the following words

_____ _____ _____ _____ _____	زَيْتون=
_____ _____ _____ _____ _____	حَشيش=
_____ _____ _____ _____ _____	قَصّار=
_____ _____ _____ _____ _____	ديكْ=
_____ _____ _____ _____ _____	شيرين=
_____ _____ _____ _____ _____	بَيْضٌ=
_____ _____ _____ _____ _____	ألكَلْبُ=
_____ _____ _____ _____ _____	السَّمَكَةُ=
_____ _____ _____ _____ _____	ثَوْراً=

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

2.11 Decoding words and write down how many characters

دارٌ= _____ ☐

بَشّار= _____ ☐

بَقدونِس= _____ ☐

حِماراً= _____ ☐

جاءَت= _____ ☐

ألشَّمْس= _____ ☐

ألبابُ= _____ ☐

2.12 Circle the chars

ث	ثعبان	لثة	ليث	
خ	خبز	بخيل	فخ	صرخ
ز	زرافة	مزاح	معتز	موز
س	سامي	مسح	لبس	راس
ض	ضوء	فضاء	غضّ	مرض
ط	طابة	عطاف	ضغط	
ع	عين	يعاد	جامع	جاع
ق	قلم	عقل	شَفَقَ	معاق
ك	كلب	بكى	ديك	شبّاك
ل	لونا	علم	عسل	جمال
ي	ياسمين	عيد	سامي	داري

2.13 Read the text and write it:

Hard-working student

I am hard working student. I go to my school every morning. In the class I listen to what my teacher says. In the arena I play with my friends.

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

2.14 Please read the following characters

أ	ب	ت	ث
ج	ح	خ	د
ذ	ر	ز	س
ش	ص	ض	ط
ظ	ع	غ	ف
ق	ك	ل	م
ن	هـ	و	ي

مقاطع قصيرة

أ	بُ	تِ	ثَ
جُ	حِ	خَ	دُ
ذِ	رِ	زَ	سُ
شِ	صُ	ضَ	طِ
ظِ	عَ	غِ	فِ
قَ	كُ	لِ	مَ
نُ	هِ	وَ	يُ

مقاطع طويلة

آ	بي	تو	ثا
جو	حي	خا	دو
ذي	را	زو	سي
شا	صو	ضي	طا
ظو	عي	غا	فو
قي	كا	لو	مي
ني	ها	وو	يي

2.15 Please read the following words:

وَلَدٌ	
قَفَصاً	
كِتابٍ	
قَصَّ	
الْكِتابُ	
نَجيبْ	
موسى	
فِراءْ	
دُخّانْ	
مَجْروحْ	
جَوادْ	
إِيجارْ	
دوخي	
جاءَ الوَلَدُ	
أَشْعَلْتُ النّارَ	

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

2.16 Spelling of words

نَجّارْ	نَجيبْ	دَجاجَة	جاءَتْ
الوَلَدُ	فِرَساً	مُعَلَّمَة	زَيْتونْ
ماءٌ	مَحْبوب	صيصانْ	صِنّارَة
الحِصانُ			

International Journal of Scientific & Engineering Research, Volume 9, Issue 1, January-2018
ISSN 2229-5518

Appendix 3: Parent's Approval Form

The presence of the student's guardian:

Subject: Participation of your son / daughter in educational research

Greetings to you,

The Preschool children were selected for participation in educational research, the research which will be held under the supervision of the Faculty of Computing, Informatics and Media at the University of Bradford, UK. Research will be conducted by Mr. Iyad Suleiman, under the supervision of Prof. Mick Ridley., Lecturer in the Faculty of Computing, Informatics and Media at the University of Bradford, UK and Prof. Reda Alhajj Lecturer in the Faculty of Computer Science at the University of Calgary, Canada.

Information to be collected is for the research service only. We pledge to maintain the privacy of the individual in all matters relating to the implementation of research, dissemination and processing of information obtained. Participation in research is voluntary and the right of the people of approval or rejection. Preschool Children involved in the research will participate in the research free of charge. Participants in the research will undergo assessment by a computerized program, the examination of the school readiness in the first grade, the program examines the basic skills required for success in school through fun games to give an accurate diagnosis on the absorptive capacities of the child and the readiness to learn in first grade next year.

Please Fill the Annex to this letter and traced back to a Preschool teacher

I agree / disagree on the participation of my son / daughter in the research
Signature _____
Child name _____
Parent name _____
Address _____
Phone _____

For more details please contact IYAD SULEIMAN at ----------