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Children Intrinsic Reading Motivation and Playful Applications: Investigating the Relationship

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Abstract- Current research suggests that children who read for pleasure are intrinsically more motivated than children who rarely read for pleasure. Recent research also indicates that children who read from e-books are more intrinsically motivated to read than children who read from traditional print books. The current trend in e-books suggests that interactive and playful content assists children to stay motivated when reading and enhance their understanding of the content. However there is a lack of research on the effects of reading from interactive and playful e-books on intrinsic reading motivation. This paper discuss how we adapted existing reading motivation scales to derive a scale to measure Intrinsic Reading Motivation that we used to compare the intrinsic reading motivation scores of 18 Omani fourth grade children after reading from a playful interactive storybook application, standard e-books, and a traditionally printed books. The results showed that reading from the playful application influenced intrinsic motivation for girls more than boys. However, children with the same reading skills obtained similar intrinsic reading motivation scores regardless of the reading format.

Keywords- *Intrinsic Reading Motivation; Playful application; children e-book, reading for pleasure; Trees of Tales; Omani children*

I. INTRODUCTION

Omani children generally read their textbooks and the Holy Quran as part of their religious and educational needs but do not read for pleasure despite its importance. Reading in general is not commonly encouraged in Omani families and Arab countries [4]. The lack of public libraries for children, the poorly prepared school libraries with limited books and limited computer learning software, the lack of support from families, and the lack of government funding, all contribute to a general decline of reading for the Omani kids [1]. However, it is important to motivate children to engage in reading or any other learning activity [31]. This study is part of a project that aims to motivate Omani children to read more and to develop a regular reading habit using the technology available in the Oman.

The impact of using e-books to motivate and improve the reading habits of children have been studied recently. A study by Maynard [27] used three devices; Kindle, iPod touch, and Nintendo DS-Lite to examine the effects on the reading habits of children aged seven to twelve years. The study revealed a positive impact on the reading habits of the children especially through the use of devices such as

the Kindle. A recent study by the National Literacy Trust revealed an increase in the positive motivation for reading for young people who read from e-books [34]. However, other empirical studies have shown no significant differences in reading motivation based on book format [46] and lower motivation levels for students who read from screen than those who read from printed books have been reported [5].

The type of motivation that is usually associated with reading for pleasure is often defined as “intrinsic reading motivation” [13, 44]. According to Colombo and Landoni [12], not only interactive but specifically playful e-books should leverage intrinsic reading motivation. Current implementations of interactive content in e-books are aimed to improve the engagement of children with the application. Such applications are fun and attractive for children because they use interactivity in the form of playful elements and flashy visual effects to motivate the children to continue reading and interacting with the application. However, not always do these interactive elements provide the kind of meaningful contribution to the text that is suggested by Colombo and Landoni [12] to support reading as the primary activity.

In order to design a playful reading experience that supports reading for pleasure, three aspects of intrinsic motivation associated with leisure reading need to be addressed [12]. These aspects are curiosity, desire for challenge, and involvement [19]. Curiosity can be fostered in a reading experience by adding elements that allow exploratory behaviour, playfulness, and interactivity [12]. Challenge can be designed by giving children the freedom to select opportunities that are suitable to their different abilities. Where involvement refers to the level of deep immersion in the text to the extent where children losing track of what is going on in the world around them. Colombo and Landoni [12] argue that in this case the playful reading will enhance intrinsic motivation for pleasure reading. However, this argument is not yet supported by empirical evidence in the literature.

II. INTRINSIC READING MOTIVATION

Reading for pleasure is the most important indicator of the future success of a child [22]. According to Guthrie and Wigfield [19], reading motivation is a multi-layered construct that includes aspects such as the person’s reading

goals, intrinsic and extrinsic motivation, self-efficiency, and other social motivations for reading. Interestingly, there is evidence that intrinsic and extrinsic motivation relate differently to literacy outcomes. Wigfield et al. [49] argue that intrinsic motivation is more effective within the context of improving reading skills than extrinsic motivation. For example, intrinsic motivation leads to an increased amount of reading for pleasure more than extrinsic motivation [13, 44]. Guthrie and Wigfield [19] describe the intrinsic motivation of reading as the curiosity about reading and a preference for challenge in reading. Kellaghan, et al., [21] found that intrinsic motivation is related to learning, conceptual understanding and higher level thinking skills. Metsala et al. [31] identified a direct relationship between intrinsic reading motivation and the frequency that children read for pleasure i.e. the more often children read, the higher their intrinsic motivation to read more for pleasure. Cox and Guthrie [13] further support this view by indicating that children read for pleasure if they are highly intrinsically motivated to read. The frequency of reading for pleasure is influenced by a number of motivational dimensions as identified by Guthrie and Wigfield. However the current research suggests that particularly intrinsic motivation has the highest impact on reading for pleasure.

Reading motivation is believed to be different between genders. Several researchers reported a higher average reading motivation for girls than for boys [7, 26, 48]. McGeown et al. [28] measured the intrinsic and extrinsic motivation for boys and girls through two separate experiments using dimensions from the Motivation for Reading Questionnaire by Wigfield and Guthrie [48]. To measure intrinsic motivation, McGeown et al. used the curiosity, involvement, and efficacy dimensions. To measure the extrinsic motivation, they used recognition and grades dimensions. They found that girls had significantly higher intrinsic reading motivation than boys but no gender differences were reported in regards to the extrinsic reading motivation [28]. Hence, when designing any type of leisure reading experience that aims to leverage the intrinsic reading motivation, gender differences need to be considered and measured separately.

Csikszentmihalyi [14] coined the term Flow to describe the “optimal experience” which is characterized by intense engagement or complete absorption in a task. Studies in 1988 revealed that reading was the most popular flow activity different cultural groups engaged in [15, 40]. McQuillian and Conde [30] identified having a choice of the text as the most common reason for experiencing Flow when reading for pleasure. They further reported that when participants were assigned texts in school, Flow was more likely to occur when the participants had an interest in the text. It is therefore possible to integrate a Flow experience in the reading activity designed for children when there are more options of topics to choose from. Computer games too are well known to provide an environment that is conducive to offer the player with a flow experience.

Roussou [37] identified computer game playing as one of the most favourite activities of children. Therefore, to strengthen the children’s experience of flow it is necessary to implement game mechanics that provide playful sense to the experience. Additionally, other guidelines for creating an optimal reading experience should be considered. These guidelines include; providing children with reading material that is suitable to their skills, of their interest, providing them with control, providing clear goals and feedback, grabbing their attention with visual elements, and keeping them busy to lose their awareness of self and hence experiencing Flow [32].

The aspects of intrinsic reading motivation and the conditions of Flow indicate that reading experiences designed for children should contain a careful selection of playful, interesting topics, and interactivity that supports the text. Additionally, the design should incorporate a balance between challenge and skill. Taking all of that into consideration, we have designed the reading application *Trees of Tales* to motivate Omani children to read for pleasure.

III. OVERVIEW OF ‘TREES OF TALES’

The design of the reading application *Trees of Tales* contains Arabic traditional folktales in order to elevate the interest of Arabic children in the reading. Playful elements such as dragging characters and objects to the scene are added to the application to provide playful experiences that encourage children stay engaged with the reading activity. There are three main characters with trees in *Trees of Tales*: Ahmed the Fisherman, Joha, and Awaisha. To read a story, a child can choose one of the three characters to visit. Once they are on the character’s page, they have the option to read one of the two existing stories of that particular character.



Figure 1. Screen shots from *Trees of Tales* application

One of the main design considerations in *Trees of Tales* was to ensure that children were actually reading the stories while engaging with the interactive features available. To this end, children are asked to set the scene and manage a few actions in the story such as selecting and positioning the relevant pose of the character in the scene and adjusting the emotional state of the characters in correspondence with the text (Fig. 1). Only if the scene was set in accordance with the text, the next page of the story would unlock. Ultimately, when the scene was completed according to the text, the Next Button appeared green and a jingle indicated that the child could proceed to the next page. Children were able to be creative by adding other images or by re-

arranging the scene in a way that did not affect the storyline. In addition to that, *Trees of Tales* enabled children to create their own story about the same character. When a child selected the option for creating a new story, they became able to write the text and built the scene using characters, objects, and backgrounds that were available in every page they created. Creating new stories formed new branches in the character's tree and resulted in the tree growing taller.

IV. MEASURING INTRINSIC READING MOTIVATION

One of the challenges of this study was the creation of a scale to measure the intrinsic reading motivation of children in regard to reading activities for pleasure. We identified four questionnaires that are commonly used in other studies to measure motivation related to reading: the *Motivation to Read Profile* [35], the *Motivation for Reading Questionnaire* [23], the *Motivation for Reading Scale* [6], and the *Intrinsic Motivation Inventory* [25]. With the exception of *Intrinsic Motivation Inventory*, the other three questionnaires have been used to measure the reading motivation of children in schools and were designed to measure a mix of intrinsic and extrinsic motivation in regards to reading. The *Intrinsic Motivation Inventory*, however, was designed to measure the intrinsic values that drive a person to perform a certain task.

The *Motivation to read Profile* (MRP) was designed by Gambrell, et al [18]. It measures two motivational dimensions; the subscales are the students' self-concept as readers and the value they place on reading the self-concept as a reader and the value for reading. It was designed specifically to scale motivation for elementary school students. The MRP two subscales are meant to explore the personal dimensions of students' reading motivation [18]. For example, the self-concept subscale is concerned with the student's opinion of his or her own reading skills. This exists under different dimensions or subscales in the other questionnaires such as the reading efficacy dimension in the MRQ survey.

The *Motivation for Reading Questionnaire* (MRQ) was designed by Wigfield and Guthrie [47] and it measures eleven dimensions including reading efficacy, challenge, curiosity, reading involvement, importance, recognition, grades, social competition, compliance, and reading work avoidance. The MRQ scale does not consider reading efficacy as an intrinsic Motivation and it is used as a separate subscale [47]. It also considers 'importance' as an extrinsic motivation and not intrinsic motivation. Wang and Guthrie [44] modified the MRQ later to include only eight dimensions of the original eleven dimensions. Three of the eight dimensions are considered intrinsic motivation dimensions, which include challenge, curiosity, and involvement. Five of the dimensions are extrinsic motivation dimensions and include competition, recognition, grades, compliance, and social interactions.

Rowe [38], on the other hand, argued that from the eight different dimensions of reading motivation only 'curiosity' and 'involvement' could be identified as components of intrinsic reading motivation. Although the MRQ has been validated and used in many studies that measure children's reading motivation [24, 29], there is some critic on its validity. For instance, Watkins and Coffey [45] argued for its need to be revised. They have investigated its validity using confirmatory factor analyses and found that the MRQ structure does not adequately fit the data.

The third questionnaire is the *Motivation for Reading Scale* (MRS) by Baker and Scher [8]. This scale is also designed for school students and it covers enjoyment, perceived value, and perceived competence as subscales. Adding to that, it measures the children interest in library-related activities such as visiting a library. The MRS measures the motivation for reading for early learners such as first grade students [8]. It takes into account that those children have not been yet reading independently. According to Baker and Scher, the items in this scale have been derived from scales such as Heathington Primary Scale [3], the Survey of Reading Attitudes [2], the Estes Attitude Scale [17], and a series of inventories developed by Gambrell et al. [18]. The items in this scale are clear, very simple and easy to translate to another language such as Arabic.

The fourth questionnaire is the *Intrinsic Motivation Inventory* (IMI) by Ryan [39] that includes subscales concerning different aspects of intrinsic motivation. Motivation theorists propose that intrinsic motivation including the interest and the enjoyment one gets from an activity is a powerful motivational force [16, 20]. The self-determination theorist, Ryan was the first to develop and use the *intrinsic motivation inventory* (IMI) [39]. The IMI is intended to assess participants' subjective experience related to a target activity in laboratory experiments. It contains seven subscales that can be used depending on which are needed. These subscales are Interest/Enjoyment, Perceived Competence, Effort/Importance, Pressure/Tension, Perceived Choice, Value/Usefulness, and Relatedness [39]. However, it is mentioned in the scale description that interest/enjoyment subscale is considered the self-report measure of intrinsic motivation and it is only the one subscale that assesses intrinsic motivation.

The four motivation scales investigated above share many elements but sometimes use different terms or group them in different subscales. For example, the perceived competence subscale in the IMI measures the personal believes of abilities and skills. The Reading Efficacy in the MRQ also refers to the personal believes of ones reading abilities. MRP uses the term self-concept to describe exactly the same thing. In other studies related to reading behaviour, the intrinsic reading motivation has been described as the curiosity about reading and a preference for challenge in reading [19]. A closer look at the subscales in each questionnaire will assist in finding dimensions that

measure intrinsic reading motivation. While we know that IMI is the only scale that was designed to measure intrinsic motivation. We strongly believe that if the subscale exists in the IMI and in another reading motivation scale then it should be used in the intrinsic reading motivation scale.

A. Common Motivation Subscales

The Intrinsic dimensions of Motivation for reading that exist in most of the above questionnaires are outlined in table 1.

TABLE 1. Common subscales in the four motivation questionnaires

Subscale	Survey
Enjoyment/Interest	IMI, MRS
Curiosity	MRQ
Importance/Value	MRQ, MRP, IMI, MRS
Involvement	MRQ
Challenge/Pressure	MRQ, IMI
Self-Concept/Reading Efficacy/Perceived Competence	IMI, MRQ, MRP, MRS

From these questionnaires, we found that Enjoyment/Interest, curiosity, and involvement have the potential to be combined in one subscale as they all share many elements. The Importance/value subscale is essential to be included as a separate subscale because of its appearance in three scales out of four and its direct relatedness to intrinsic motivation. Challenge is included as a subscale in the MRQ survey but a similar subscale in IMI is pressure/tension. However, the IMI stresses on the feeling of anxiety and tension while doing an activity such as saying “I was anxious while working on this task” whereas the MRQ focuses on the benefits of reading versus its difficulty to use such as in “I usually learn difficult things by reading.” Hence, the similarity is not strong in the context of the questions in both scales. Additionally, the MRQ does not consider the challenge dimension as an intrinsic motivation factor but part of self-efficacy and competence beliefs [48]. For this reason, we did not add the challenge as a direct subscale in the Intrinsic Motivation for Reading Scale but part of perceived competence that exists in most scales. The self-concept/reading efficacy/perceived competence subscale is also used in most of the scales and will be considered as the third subscale in intrinsic motivation for reading scale. Table 2 illustrates the final subscales and the scales they currently exist in.

TABLE 2. Most used subscales in relation to intrinsic motivation

Final Subscale	Similar Subscales	Surveys contain subscales
Enjoyment	Interest, Involvement, Curiosity	IMI, MRS, MRQ
Value	Importance, Value, Usefulness of reading	MRQ, MRP, IMI, MRS
Perceived Competence	Reading Efficacy, Self-concept	IMI, MRQ, MRP, MRS

Based on this information we noticed that all of the four scales share the same subscales except that the MRP, which

does not include a subscale for enjoyment. A further investigation was conducted by laying out all of the questions of a subscale in each questionnaire. Questions that have been repeated in the different scales were highlighted and taken into the final subscale section for our intrinsic reading motivation scale. The questions were put together and tested for readability and ease of use with four Omani children in grade four.

B. The Design of the Intrinsic Reading Motivation Scale

From this study, we have found that intrinsic motivation for pleasure reading rely on the enjoyment a person feels from the reading activity, the level of interest a person has to the reading topic and how engaging and involving the reading is. The intrinsic motivation is also affected by the challenge in relation to the reader’s reading ability and the perceived value of reading. However, the perceived choice (autonomy) subscale in the IMI, cannot be applied in leisure reading situations as people only read for pleasure by their own choosing.

In designing children surveys, it is better to have a questionnaire that is as short but covers the research questions. Longer questionnaires are likely to have lower response rates [36]. Two to three printed pages of big font questions is a common children survey design [33]. This can be achieved by separating each subscale questions in a page with three to four questions in each page. After analysing the existing surveys that measure reading motivation and intrinsic motivation, we found the following statements to be common:

Enjoyment

1. Reading is a very interesting thing to do
2. I like to read
3. I think reading is a boring way to spend time (r)

Value

4. It is very important to me to be a good reader
5. I think people can learn new things from reading
6. I think reading could help me become a better student

Self-Competence

7. I am a good reader
8. I know that I will do well in reading next year
9. Reading is hard for me (r)

These items make up the Intrinsic Reading Motivation Scale (IRMS) that is derived from the MRQ, MRP, MRS, and IMI. Just like most of these surveys, we use the scale 1 to 4 to answer the questions in IRMS with smiley faces to represent the answers. Since the experiment was performed with Arabic children, the scale was translated into Arabic language and was pilot tested with four children from Oman.

V. METHOD

The objective of this study was to identify if reading from a playful application influences the intrinsic reading motivation for children in Oman differently compared to basic e-books and traditional print books. To this end, we collected and compared the intrinsic reading motivation

scores of 18 fourth grade children after reading from a playful application, a basic e-book, and traditionally printed books. In this study, we used within-subject measure design in which we exposed all participants to all the reading interventions in a counterbalanced order [9]. This was achieved by dividing the participants into smaller groups where they were given the interventions in different weeks. This type of experiment design was preferred over the between-subject design for several reasons. One of the reasons is that within-subjects design is suitable for examining how individual behaviour changes when the circumstances of the experiment changed [9]. Another reason for choosing this type of design is that it supported experiments with a small number of participants. This was necessary as the number of iPad tablets available for this study was limited to only twelve. Additionally, within-subject design is common in research when investigating technology use and behavioural changes on children [10, 41, 42].

A. Procedure

Eighteen students from the fourth grade of a public primary school in Oman were randomly selected from six classes. The mean age of the students was 9.2 (SD = 0.46). The students were selected based on their teacher’s perception of their academic performance. Teachers were asked to recommend one high, one average and one low performing student from each class in order to have equal number of participants in each performance category for later comparisons. Additionally, to get equal numbers of females and males in the experiment, only males were selected from the first three classes, and only females from the other three classes. Every three students from each class were considered a group leading to a total of six groups that were named according to their class number.

The three reading interventions used in the study were:

- *Trees of Tales* application (TT) – designed by this study’s researchers and read from an iPad2
- Traditional print storybooks (PB) – currently available in the school library and to all children in Omani public schools. With the help of the school librarian, children were given the option to select the books they wanted to read out of a collection of 40 storybooks
- *Arabic Stories*¹ Basic iPad e-book (EB) – available in the App Store for downloading. It contains five Arabic children’s e-books. The interactive elements in this e-book application include navigating and selecting one of five books, flipping the pages in the book, and turning audio narration on or off.

Throughout the experiment, the participating children swapped the reading interventions within three reading sessions that were performed across three different weeks.

Each child was also able to take home a different reading intervention to read each weekend. By the fourth week, all of the 18 participants had read from all three reading interventions both in school and at home.

The data collection instrument used was the Intrinsic Reading Motivation Scale (IRMS) as discussed in the previous section. This scale was given to participants three times during the period of the study, which was four weeks. It was given after students returned each of the three interventions. The scale contains three questions for each subscales and the participants answer the questions by selecting the most appropriate ranking from 1 to 4. Where ‘1’ refers to not agree at all and ‘4’ refers to agree very much. For analysing the results of the survey, each item is scored on a 1 to 4 scale. Higher scores mean stronger endorsement of the item. The sum of the scores of all the questionnaire items provided a total score of the intrinsic reading motivation for each participant.

VI. RESULTS AND DISCUSSION

Participants read voluntarily from each intervention for one week in school and at home throughout the weekend. They were asked to complete the IRMS on the day they returned their reading interventions. Each participant used the IRMS three times in three separate weeks after returning the printed books, the basic e-book, and *Trees of Tales*. These scores were entered into SPSS for each participant and descriptive statistics were calculated. As shown in table 3 below, the means for the IRMS scores after participants read from the three interventions were very similar. The mean is approximately 34, which is very close to the maximum score in the survey (36). This positive intrinsic reading motivation was the same after the participants read from all of the three reading interventions. This indicates that children in the sample group had a very high intrinsic reading motivation in general. The results seem to indicate that the fourth grade Omani children that we tested at the Al-Waha School in Muscat, Oman have a high intrinsic motivation for reading regardless to the medium they use to read.

TABLE 3. Statistics for IRMS scores after reading from the three interventions

	N	Range	Mean	STD
IRMS scores after reading <i>Printed Books</i>	18	5.00	34.500	1.6539
IRMS scores after reading <i>Arabic Stories</i>	18	4.00	34.500	1.6179
IRMS scores after reading <i>Trees of Tales</i>	18	4.00	34.833	1.4653

The standard deviation for the scores after each reading intervention was somewhat similar but slightly smaller for the *Trees of tales* intervention. This is also obvious in figure 2 below where the boxplot that represents the standard deviation for IRMS scores after reading from *Trees of Tales* is comparatively shorter than the other two boxplots. While the intrinsic motivation box plots of print books and e-books are quite similar and only differ in the

¹<https://itunes.apple.com/us/app/arabic-stories/id392531885?mt=8>

lower quartile, the box plot of trees of tales is quite different which warrants further investigation. However, this suggests that overall participants had a high level of agreement with each other in their intrinsic motivation after reading from *Trees of Tales*. Additionally, it is clear from the graph that the median for IRMS score is slightly higher after reading from *Trees of Tales* than from printed books and the basic e-book.

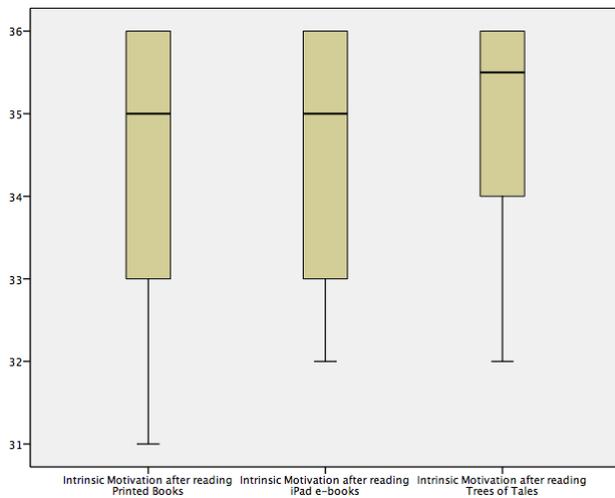


Figure 2. Boxplot for the IRMS scores after reading from the three reading interventions

A further Friedman test was performed in SPSS to report any statistical significant differences between intrinsic reading motivations when participants read from the three interventions. The test revealed no statistical difference among the scores of the three IRMSs. This finding supports the view that primary school children in this age group are highly intrinsically motivated to read for pleasure. As it was mentioned in the literature, the intrinsic motivation is the key driver for leisure reading [13, 44]. This is also supported by previous research, which found that children at early ages are motivated to read, but with age increases; their motivation starts to decline [11]. The difference in median score and the higher level of agreement amongst the students who used the *Trees of Tales* reading intervention requires further investigation with a larger sample size. Additionally, investigating other aspects such as the effect of involving schools and families to participate in the reading, on intrinsic reading motivation will inform the findings as it encourages sharing.

When it came to comparing gender with scores obtained in the three IRMS surveys, we found interesting results. The scores for the male students were concentrated almost around the same range for the three reading interventions (see Figure 3). The noticeable difference is that the median score of intrinsic motivation after reading from the printed books is one point higher than the median score after reading from both the iPad applications. This is not a significant difference and therefore, we can say that book format does not effect the intrinsic motivation for reading

with boys. On the other hand, females scored lower intrinsic motivation than boys after reading from printed books and basic e-book. However, the median score for females' intrinsic motivation was higher after reading from *Trees of Tales*. The boys' intrinsic reading motivation on the other hand, was higher than the girls when they read from the basic e-book stories and the printed storybooks. Previous research found that females have higher reading motivation especially the intrinsic motivation than males [7, 26, 28, 48]. In our study, we found that book format influence the intrinsic motivation differently with gender. Females' intrinsic motivation is influenced more by playful reading application where males' intrinsic motivation is stimulated slightly more by reading from printed books. The reasons behind these differences could have been investigated more by a follow up interviews with the participants.

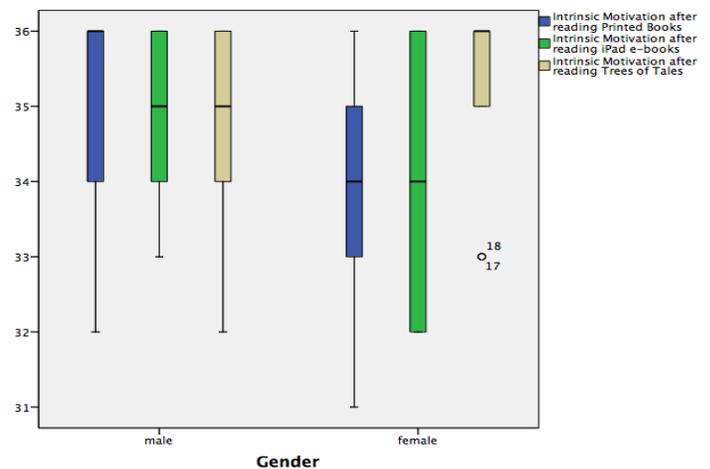


Figure 3. Boxplot for the IRMS scores grouped by gender

Furthermore, we examined the effects of using different reading formats on intrinsic reading motivation in correlation with reading skills. The investigation was performed to compare the reading abilities of the participants and their intrinsic reading motivation scores after each reading interventions. The results show that participants with higher reading ability obtained higher intrinsic reading motivation than students with lower or average reading abilities. This finding supports previous research regarding reading skills and motivation [29, 43]. A general finding was that school students with better reading skills have higher intrinsic reading motivation than students with lower reading skills. However, in this study, we found that the differences in regards to book format do not correlate to reading abilities. Specifically, we found that reading from playful applications does not influence high or low performing children's intrinsic reading motivation more than reading from the other format. Figure 4 explains the finding more clearly.

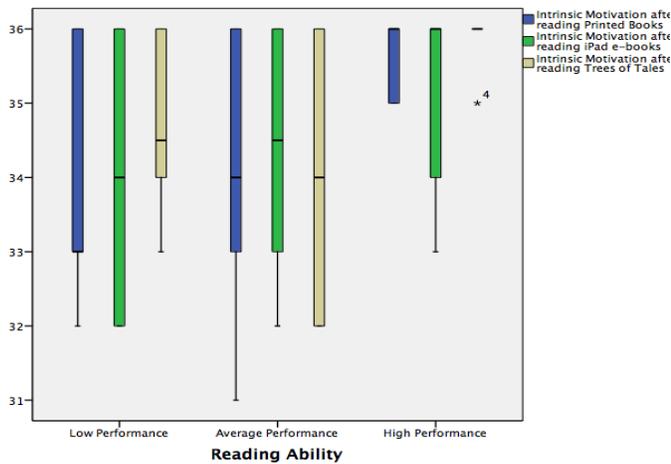


Figure 4. Boxplot for the IRMS scores grouped by reading ability

VII. CONCLUSION

Children in Oman and everywhere in the world need to be motivated to read for pleasure. To increase their motivation, we need to enhance their reading experiences. In this study, we aimed at achieving that by designing a playful reading application, *Trees of Tales*. Eighteen Omani children who also read from regular storybooks and basic e-books used this application. We have used repeated measures to compare the intrinsic reading motivation scores for children who read from the three interventions. Analysing the scores indicate that playful reading applications do influence – although not significantly – intrinsic reading motivation more than other reading formats.

At the early age of 9 and 10 years, children seem to be intrinsically motivated to read for pleasure regardless of the format this reading exists in. However, with a small sample of participants, we found that intrinsic motivation is slightly better when children read from a playful application that contains interactivity, which is related and supports the reading. In our study, the female school children were more intrinsically motivated to read from the playful application *Trees of Tales*. The male school children surprisingly were more intrinsically motivated to read from printed books. In addition, we found that, children who perform better at reading, enjoy reading from any format.

These findings are very important to provide recommendations for schools and government in the Arabic world. Implementing playful applications that supports reading for pleasure will essentially influence primary school children to read more often. This will influence the children's reading and overall achievement in school. However, it is important to mention that these unique results are subject to the Arabic culture and limited by the small number of participants. Future studies will include a bigger sample and a comparison between more than one culture to obtain similarities and differences.

VIII. REFERENCES

- [1] Al Abri, H. (1995). An Investigation into the need for Children's Libraries in Oman (*Unpublished master's thesis*). Manchester Metropolitan University
- [2] Alexander, D. G., & Engin, A. W. (1986). Dimensions of reading attitude of primary students. *Educational and psychological measurement*, 46(4), 887-901.
- [3] Alexander, J. E., & Filler, R. C. (1976). Attitudes and reading. *International reading association*.
- [4] Al-Yacoub, I. (2012). Sum of All Fears: Arabs read an average of 6 pages a year, study reveals. Retrieved from english.alarabiya.net website: accessed 21 August 2012.
- [5] Aydemir, Z., & Ozturk, E. (2012). The Effects of Reading from the Screen on the Reading Motivation Levels of Elementary 5th Graders. *Turkish Online Journal of Educational Technology-TOJET*, 11(3), 357-365.
- [6] Baker, Linda. (2003). The Role of Parents in Motivating Struggling Readers. *Reading & Writing Quarterly* 19, no. 1, 87-106.
- [7] Baker, L., & Wigfield, A. (1999). dimensions of Children's Motivation for Reading and Their Relations to Reading Activity and Reading Achievement. *Reading Research Quarterly*, 34, 452-477.
- [8] Baker, L., & Scher, D. (2002). Beginning Readers' motivation For Reading In Relation To Parental Beliefs And Home Reading Experiences. *Reading Psychology*, 23(4), 239-269.
- [9] Charness, G., Gneezy, U. & Kuhn M (2012). Experimental Method: Between-Subject and Within-Subject Design. *Journal of Economic Behavior & Organization*, 81, 1-8.
- [10] Ciampa, K. (2013). Electronic Storybooks: A Constructivist Approach to Improving Reading Motivation in Grade 1 Students. *Candian Journal of Education* 35 (4), 92-136.
- [11] Clark, C., & Foster, A. (2005). Children's and Young People's Reading Habits and Preferences: The Who, What, Why, Where and When. *National Literacy Trust*.
- [12] Colombo, L., and M. Landoni. (2014). Serious Games or Playful Books. In *How Interactive eBooks can Better Support Leisure Reading. IBOOC2014-2nd Workshop on Interactive eBook for Children at IDC*.
- [13] Cox, K.E., & Guthrie, J.T. (2001). Motivational and Cognitive Contributions to Students' amount of Reading. *Contemporary Educational Psychology*, vol. 26, 116-131
- [14] Csikszentmihalyi, M. (1975). *Beyond Boredom and Anxiety: Experiencing Flow in Work and Play*. San Francisco: Jossey-Bass
- [15] Csikszentmihalyi, M., & Csikszentmihalyi, I. (1988), "Introduction to Part IV" in *Optimal Experience: Psychological Studies of Flow in Consciousness*, Cambridge, Cambridge University Press.
- [16] Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum
- [17] Estes, T. H. (1971). A scale to measure attitudes toward reading. *Journal of Reading*, 135-138.
- [18] Gambrell, L. B., Palmer, B. M., Codling, R. M., & Mazzoni, S. A. (1996). Assessing motivation to read. *Reading Teacher*, 49, 518-533.
- [19] Guthrie, J. T. and Wigfield, A. (2000). Engagement and motivation in reading. In M.L. Kamil, P.B. Mosenthal, P. D. Pearson, and R. Barr (Eds.), *Handbook of Reading Research* (3rd Ed.). New York: Longman.
- [20] Harter, S. (1981). A new self-report scale of intrinsic versus extrinsic orientation in the classroom: Motivational and informational components. *Developmental psychology*, 17(3), 300.

- [21] Kellaghan, T., Madaus, G. F., Raczek, A (1996) *The Use of External Examinations to Improve Student Motivation*. Washington, DC
- [22] Kirsch, I, Jong, J de, Lafontaine, D, McQueen, J, Mendelovits, J, & Monseur, C. (2002). Reading For Change: Performance and Engagement Across Countries. *Organisation for Economic Co-operation and Development (OECD)*.
- [23] Lau, K. (2004). Construction and Initial Validation of the Chinese Reading Motivation Questionnaire. *Educational Psychology* 24, no. 6, 845-65.
- [24] Lau, K. L., & Chan, D. W. (2003). Reading strategy use and motivation among Chinese good and poor readers in Hong Kong. *Journal of Research in Reading*, 26(2), 177-190.
- [25] Leng, E. Y., Baki, R., & Mahmud, R. (2010). Stability of the Intrinsic Motivation Inventory (IMI) for the Use of Malaysian Form One Students in ICT Literacy Class. *Eurasia Journal of Mathematics, Science & Technology Education*, 6(3), 215-226.
- [26] Marinak, B. A., & Gambrell, L. B. (2010). Reading motivation: Exploring the elementary gender gap. *Literacy Research and Instruction*, 49(2), 129-141.
- [27] Maynard, S. (2010). The Impact of e-Books on Young Children's Reading Habits. *Publishing Research Quarterly*, 26(4), 236-248. doi: 10.1007/s12109-010-9180-5
- [28] McGeown, S., Goodwin, H., Henderson, N., & Wright, P. (2012). Gender differences in reading motivation: does sex or gender identity provide a better account?. *Journal of Research in Reading*, 35(3), 328-336
- [29] McGeown, S. P., Norgate, R., & Warhurst, A. (2012). Exploring intrinsic and extrinsic reading motivation among very good and very poor readers. *Educational Research*, 54(3), 309-322
- [30] McQuillan, J., & Conde, G. (1996). The Conditions of Flow in Reading: two studies of optimal experience. *Reading Psychology*, 17(2), 109-135. doi: 10.1080/0270271960170201.
- [31] Metsala, Jamie L, Wigfield, Allan, & Dacey, McCann Ann. (1996). Children's Motivations for Reading. *The Reading Teacher*, 50(4), 3.
- [32] Nakamura, J & Csikszentmihalyi M. (2002). The concept of flow. *Handbook of positive psychology*, 89-105.
- [33] O'Reilly, M., Dogra, N., & Ronzoni, D. (2013). *Research with Children: Theory and Practice*. Sage.
- [34] Picton, I. (2014). The Impact of ebooks on the Reading Motivation and Reading Skills of Children and Young People: A rapid literature review, London: National Literacy Trust
- [35] Pitcher, S. M., Albright, L. K., DeLaney, C. J., Walker, N. T., Seunarine Singh, K., Mogge, S., & Dunston, P. J. (2007). Assessing adolescents' motivation to read. *Journal of Adolescent & Adult Literacy*, 50(5), 378-396.
- [36] Roszkowski, M. J., & Bean, A. G. (1990). Believe it or not! Longer questionnaires have lower response rates. *Journal of Business and Psychology*, 4(4), 495-509.
- [37] Roussou, M. (2004). Learning by doing and learning through play: an exploration of interactivity in virtual environments for children. *Computers in Entertainment (CIE)*, 2(1), 10-10.
- [38] Rowe, K. J. (1991). The influence of reading activity at home on students' attitudes towards reading, classroom attentiveness and reading achievement: An application of structural equation modelling. *British Journal of Educational Psychology*, 61(1).
- [39] Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, 43 450-461.
- [40] Sato, I. (1988). *Bosozoku: flow in Japanese motorcycle gangs*. In M. Csikszentmihalyi & I.S. Csikszentmihalyi (Eds.). *Optimal experience: Psychological studies of flow in consciousness* (PP.92-117). Cambridge, Cambridge University Press.
- [41] Sim, G., MacFarlane, S., and Read, J. (2006). All work and no play: Measuring fun, usability, and learning in software for children. *Computers & Education*, 46. 235-248
- [42] Stoeckle, K. (2012). Page Turning and Mouse Clicking: A Comparison of e-books and an Adult Reader on Comprehension Measures. *Rising Tide Volume 5*. Department of Educational Studies. St Mary's College of Maryland.
- [43] Unrau, N., & Schlackman, J. (2006). Motivation and its relationship with reading achievement in an urban middle school. *The Journal of Educational Research*, 100(2), 81-101.
- [44] Wang, J.H.Y. and Guthrie, J.T. (2004). Modeling the effects of intrinsic motivation, extrinsic motivation, amount of reading, and past reading achievement on text comprehension between U.S. and Chinese students. *Reading Research Quarterly*, 39, 162-186.
- [45] Watkins, M. W., & Coffey, D. Y. (2004). Reading Motivation: Multidimensional and Indeterminate. *Journal of Educational Psychology*, 96(1), 110.
- [46] Wells, C. L. (2012). Do students using electronic books display different reading comprehension and motivation levels than students using traditional print books? (Doctoral dissertation, Liberty University).
- [47] Wigfield, A., & Guthrie, J. T. (1995). Dimensions of Children's Motivations for Reading: An Initial Study. *Reading Research Report* No. 34.
- [48] Wigfield, A. & Guthrie J.T. (1997). Relations of Children's Motivation for Reading to the Amount and Breadth of Their Reading. *Journal of Educational Psychology*, 89(3), 420-43.
- [49] Wigfield, A., Guthrie, J. T., Tonks, S., & Perencevich, K. (2004). Children's Motivation for Reading: Domain Specificity and Instructional Influences. *The Journal of Educational Research*, 97(6), 299-309.