## Third Study

# International Kindergarten Teachers and the Dilemma in Finding Suitable App for Teaching English

By

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***Abstract:***

This paper describes the significance of digital platforms in enhancing the learning and understanding of young English as Secondary Language (ESL) learners and offers them opportunities to improve their English language skills with the help of ECEC settings.

The paper elucidates specific benchmarks that are highly essential for shortlisting apps capable of enhancing the quality of the English language for learners. The structure of this paper includes a literature review section critically evaluating the significance of educational apps for young learners. The second part of the work focuses on the identified benchmarks that carry out the entire process of evaluation, which selects only six educational apps.

Digital gadgets are rapidly becoming an educational means for young ESL learners in the Kingdom of Saudi Arabia, where they learn more about English as their second language. The literature review has the significance of educational apps for enhancing English and developing effective communication skills. The study identifies preschoolers as primary stakeholders who will use the findings of this study to select the most effective ESL educational app. The benchmarks include interactive communication, language development, coordination, and usability. Overall, the findings necessitate conducting more research on investigating child-friendly learner ESL apps.

***Keywords:*** International Kindergarten - Teachers Dilemma - Suitable App - Teaching English.

***ملخص :***

تصف هذه الورقة البحثية أهمية المنصات الرقمية في تعزيز تعلم وفهم متعلمي اللغة الإنجليزية كلغة ثانية (ESL) الصغار، وتوفر لهم فرصًا لتحسين مهاراتهم في اللغة الإنجليزية بمساعدة بيئات التعليم المبكر والرعاية .توضح الورقة معايير محددة ضرورية لاختيار التطبيقات القادرة على تحسين جودة اللغة الإنجليزية للمتعلمين .يتضمن هيكل هذه الورقة قسمًا لمراجعة الأدبيات لتقييم أهمية التطبيقات التعليمية للمتعلمين الصغار بشكل نقدي .يركز الجزء الثاني من العمل على المعايير المحددة التي تُجري عملية التقييم بأكملها، والتي تختار ستة تطبيقات تعليمية فقط .تتحول الأجهزة الرقمية بسرعة إلى وسيلة تعليمية لمتعلمي اللغة الإنجليزية كلغة ثانية الصغار في المملكة العربية السعودية، حيث يتعلمون المزيد عن اللغة الإنجليزية كلغة ثانية .تُبرز مراجعة الأدبيات أهمية التطبيقات التعليمية في تحسين اللغة الإنجليزية وتطوير مهارات التواصل الفعال .تُحدد الدراسة أطفال ما قبل المدرسة كأصحاب مصلحة رئيسيين سيستخدمون نتائج هذه الدراسة لاختيار أكثر تطبيقات اللغة الإنجليزية التعليمية فعالية .تشمل المعايير التواصل التفاعلي، وتنمية اللغة، والتنسيق، وسهولة الاستخدام .بشكل عام، تستدعي النتائج إجراء المزيد من البحوث حول تطبيقات تعليم اللغة الإنجليزية كلغة ثانية المناسبة للأطفال .

**الكلمات المفتاحية:** رياض الأطفال الدولية – معضلة المعلمين – التطبيق المناسب – تدريس اللغة الإنجليزية.

## *Introduction:*

### *The Educational Value of Digital Play:*

Research shows that around one in three pre-schoolers retain direct access to a touchscreen; this situation is not uncommon in Australian toddlers and infants who spend 14 hours a week on screen, and children aged 2 to 5 years consume 26 hours per week (Rhodes, 2017).

The presence of digital devices has attracted many app developers to create more apps for children due to the ubiquitous use of digital apps among children (Danby et al., 2018). Neumann (2014) says that apps are software applications that encompass tablets, touchscreens, and iPads, enabling users to access content using the Internet. For example, modern learning environment apps are highly popular educational apps as their features attract the attention of young learners (Danby et al., 2018; EU Kids Online, 2014).

They feature numerous arrangements that children can swipe and tap the screen (Neumann, 2014). The primary benefits of these devices include a sensorial environment that employs colorful pictures enabling children to learn the alphabet, memorize, and play games, locate objects and their features, highlighting the means to develop and learn more about daily life stories (Tahnk, 2011).

The use of learning environment gadgets has substantially changed the educational process of children. Oakley et al. (2018) contend that early childhood academic institutions now offer iPads and tablets as a way to enable children to learn things quickly. These institutions now provide more child-friendly apps, especially for early childhood education centers (Geer et al., 2017; Lee, 2015; Northrop & Killeen, 2013). Fundamentally, various aspects have developed an interest in introducing them in early childhood education.

First, the user-friendly application and multimodal features have convinced academic institutions to incorporate these gadgets in the early childhood education system (Lauricella et al., 2014; Neumann & Neumann, 2014; Siegle, 2013; Lu et al., 2017). Numerous advantages are available when academic institutions use these technological tools; the uses also include developing languages, a key feature among academicians to inculcate language learning .

A careful and well-researched use of educational apps in early childhood education centers remains the top priority of educators. App suitability remains the most critical aspect while identifying and selecting an app for ECECs. For instance, an early childhood school teacher must consider class, age, gender, and their preferences of the majority of students in the class, must be considered. In other words, an educational app fails to satisfy academic objectives when it does not include highly relevant features for identified students, who will use the app to learn more about their surroundings and social process.

A closer analysis reveals that the above-mentioned pre-requisites are substantially primary conditions for an educational app, as they collectively and individually represent those learning dimensions that children love to learn more about.

Social context is one area that encourages children to learn social interaction, make new friends, shake hands, and other social aspects of their academic life. In this context, an education app must highlight how a child can become socially rich through social activities, interactions, and social behaviors, and so on. Some academicians have added more characteristics to apps that are highly effective for enhancing the learning of children. For instance, the use of sensorimotor, rules-based video games, and game practices represents their presence in educational apps (Nilsson et al., 2018; Keung & Cheung, 2019).

Behavioral and entertainment aspects should be in educational apps. For instance, decision-making, scenario development, and imagination must be used by children while operating an educational app (McManis & Gunnewig, 2012). Decision-making is one aspect of cognitive skills that encourages a child to take a position while using an educational app. By taking a position in a game, the child will apply their mental skills, including imagination, to play a video game by using an educational app (McManis & Gunnewig, 2012). In other words, learning becomes secondary when a child uses an educational app to win the game.

However, attitudes and behaviors of young learners are relevant indicators as they indicate how a young learner retains their motivation for learning a new language (Mifsud et al., 2013). Apart from teaching English through apps, it is essential to identify the interests and behavior of learners, as they play a significant role in learning new languages. Still, an effective way to increase motivation is to bring entertainment or fun into learning, as it retains a strong relationship with their motivation level .

Subsequently, this strategy is capable of enhancing the retention and recall capabilities of English learners (Shokri & Abdolmanafi-Rokni, 2014; Yesilbag &Korkmaz, 2021).

The use of educational technology for preschool students supports the Saudi Vision of 2030 (2021) as it fosters the culture of innovation and development, and an educated Saudi nation that can manage its future. This perspective is highly workable as playful activities increase the cognitive skills and capabilities of children, including attention and focus (Vygotsky, 1978; Stipek et al., 1998). In the context of a digital learning environment for early childhood education, the Saudi National Curriculum Framework play a fundamental role as a conceptual framework for a child’s learning in diverse learning settings, encompassing both combined learning and professional learning contexts for adult learners.

This segment explains four phases that ascertain the suitability of educational apps for enabling children to learn English as a Second Language. The primary objective of this phase was to research and make a document highlighting all available educational apps for early childhood educational institutions. The Saudi National Curriculum Framework ( 2018) have identified a selection benchmark for identifying effective educational apps for early childhood education (Saudi National Curriculum Framework [SNCF], 2018). It also includes the role of technology and social communication channels .

The primary objective of selecting an educational app for children is to enhance their social communication and interaction experience, friend identification, and play process (Weisberg et al., 2013). It also evaluated how the features of educational apps develop and retain their relationship with a child's understanding and learning .

The four phases of the educational apps examination process concentrated on unique aspects of the benchmark:

Table 1

*Educational App Evaluation Strategy*

| |
|---|
| Phase 1: Preliminary Screening by Fundamental Characteristics |
| Phase 2: Assessing Age Relevancy and Usability |
| Phase 3: Examining the Characteristics of Educational Game-Based Design |
| Phase 4: Evaluating Pedagogical Soundness for Early Childhood Language Learning for ESL Learners |

***Phase 1: Preliminary Screening by Fundamental Characteristics***:

The preliminary screening of fundamental characteristics of educational apps remained the most crucial phase. The first phase focused on using the Apple App Store, an ideal platform for searching educational apps for children's learning. Before commencing the searching process, it was necessary to select keywords that would help locate the required educational apps. For instance, keywords were "language learning for children." Unfortunately, this keyword failed to bring the necessary and relevant apps useful for early childhood education. This situation necessitated changing the search strategy to reach and download the related educational apps.

Subsequently, a diverse search strategy enabled the researcher to apply numerous keywords simultaneously and individually to see whether the results bring any relevant educational apps. The diverse search strategy used the keywords "Kids' story", "Children's English vocabulary", "learn English", "ESL children, and "Children's language development." Unfortunately, the second diverse search strategy only generated literacy apps instead of learning development and language learning educational apps.

The subsequent research strategy brought the required educational apps. For instance, the keywords "Best Apps for Kids" generated a list of numerous apps on the Common Sense Media site (Common Sense Media, 2019). This site hosts various educational apps. However, the researcher subsequently modified the research strategy by narrowing down the scope of the keywords from the drop-down option. The latter results included "preschoolers (2-4)" and "little kids (5-7)." This search method selected fifty educational apps. The primary advantage of this search was the availability of a description of all apps in English, providing an opportunity to learn more about the identified apps.

Even this search strategy brought literacy-related educational apps rather than secondary language learning apps designed for early childhood educational institutions. Unfortunately, this website also failed to satisfy the expectations of the search strategy. The researcher subsequently used the Google search bar with the following keywords: “English language learning for pre-schoolers”, “learning English”, and “pre-school English learning.” The search results also generated similar results previously provided by the Common Sense website.

A specific selection and rejection benchmark helped to identify relevant and effective educational apps during the first phase. The researcher applied the fundamental characteristics of educational apps to approve or disapprove of an educational app. For instance, the app’s purpose, audience, cost, reviews, group permission, and language diversity were the key components of the search strategy during the initial phase of the research. The first phase selected 30 apps as they were highly relevant and satisfied the research objectives.

For instance, the purpose of an aim describes specific uses and perspectives related to an educational app. Fundamentally, an app has two primary features that explain its purpose, and they include “open” or “closed.” An app is closed, and it includes preset objectives that the game player tries to access. For instance, if a child game player successfully answers a correct question, this outcome is rewarded with cues or a positive sound of music. In contrast, an educational app works as an “open” one if it does not include a pre-set purpose or goals. A suitable example of an educational open app encourages a child to draw an image on the screen of the app, encompassing digital narratives or perspectives (Flewitt et al., 2015).

Particularly, the primary advantage of using an open educational app is that it provides an opportunity for a child to apply their creative skills, whereas closed educational apps require a child to select one option out of provided choices . Based on these results, the researcher selected both open and closed educational apps as they were aligned with the intended educational objectives of this process.

Subsequently, the researcher also considered the relevance of specific markets where educational apps are in high demand. For instance, the researcher excluded those apps that did not target children as their primary users. Also, early language development was another purpose of an educational app, as it fulfilled the developmental conditions.

The researcher also examined the price of an educational app. First, a free download option was first condition on a tablet, and the app’s affordability must be within the reach of early childhood educational institutions.

The researcher also considered user reviews as a primary app evaluation method. Numerous reasons were relevant while reading user reviews. The primary benefit of using user reviews is that they allow a researcher to read the perspective of previous users and try to understand their experience, relevance, and app appropriateness for early childhood education institutions. For instance, numerous stakeholders, such as teachers, companies, parents, and other users, share their experience and perspectives on whether they recommend buying it or look for other sources to purchase early childhood educational apps.

Specifically, app features, its content, both constructive and non-constructive views, its suitability for young students, and all other features of learning were part of the reviews found on the website (Common Sense Media, 2019).

The researcher also considered the presence of receipts for awards. As a rule of thumb, if an app is highly effective for its identified market users, it receives numerous awards in the form of the following aspects: “Editor’s Choice”, “Parent’s Choice”, “5 Star”, “All Time Best”, “Teachers with Apps Certification”, and “Children’s Technology Review.” These aspects enabled the researcher to include an educational app, reflecting these awards. However, the researcher still added some apps that failed to display such awards because they satisfied the other related conditions of educational apps.

In summary, the researcher assessed the relevance of apps to observe whether two or more children can play simultaneously. Ensuring this goal substantially relied on the accurate assessment of educational apps as they must satisfy social goals, communication objectives, and learning tendencies (Roskos et al., 2014).

The researcher also evaluated English apps as they were consistent with the selection benchmarks. The primary goal of selecting English language apps was to provide children with an opportunity to learn more about English and use it in their daily lives.

Phase 2: Assessing Relevancy and Usability as Suggested by ECEC Settings

The primary goal of phase 2 was to assess whether the selected app characteristics satisfy the benchmarks identified in Table 3.1. The application of the selected benchmarks reduced the apps to twenty-five from thirty, highlighting the effectiveness of the benchmarks and their suitability for further evaluation of the apps. The features in phase 2 included navigational features, customization for solo play or multiple players, sound effects, visual dimensions, different languages, gender issues, attention time properties, and reading skills.

Educational apps must provide child-friendly navigation options for child users. An app must enable a child user to scroll through different slides and easily understand the unique options and slides mentioned in the app. Sound, animation, and navigation processes must simplify the process of running and playing an educational app.

The concept of user-friendly apps is that an app must guide a child user on how to go to the next stage of a game, or how to quit a game or start a new one easily, as these navigation steps and examples create further interest in child users in such apps (Israelson, 2015). It is pivotal for a child-friendly app to provide all touchscreen options that can capture the attention of a child. They include drag, tap, wipe, and press options, as they enhance the user-friendliness of the app. Sensory response and engagement are enhanced when these features include music, sound, and animated aspects (Geist, 2014; Marsh et al., 2015).

Subsequently, an app must offer free choices that enhance the quality of freedom to choose an option within the educational app (Nolan & McBride, 2014). Consequently, the control of senses during app use and its exploration tendencies enhance the academic learning of children in educational apps (McManis & Gunnewig, 2012).

Customization offers numerous difficulty levels within an educational app. The primary benefit of this customization process is that it enhances their cognitive skills for playing a game or running an educational app using their operational skills. Subsequently, rewards and punishment aspects occur within an app when a child plays and experiences either success or failure. As a result, the identified and customized difficulty levels of apps also convinced the researcher to include them. Sound and music features of apps also found their place in the selection benchmark of the evaluation process in phase 2, as they provide an opportunity to hear English words and sentences.

The evaluation of apps occurred when they provided a child user with the ability to chat in English or other languages. Simultaneously, gender and ethical biases were given due consideration in the evaluation process in phase 2, and the researcher excluded those apps that exhibited gender stereotyping and ethical limitations.

The characteristics evaluation phase also utilized the operational capability of an app to develop and ensure the engagement of a child user. ECEC encourages all characteristics of apps that enhance learning, cognitive, and social skills, as well as the developmental requirements of a growing child. Innovation, play, and identification of new learning avenues through collective or individual play remain the most significant developmental and learning factors for a child (Piaget, 1962; Vygotsky, 1986; Edwards & Cutter-Mackenzie, 2011). Fundamentally, children's engagement does not last for long, and they become easily bored. This dimension is highly crucial while evaluating apps. Consequently, the researcher selected those apps that were capable of ensuring the sustained engagement of children in phase 2.

These characteristics (animated effects and sounds) develop curiosity and enable the child to choose an activity within educational apps (Breathnach et al., 2017). Play functions characteristics increase interest and engagement of a child user (Merchant, 2015; Neumann & Neumann, 2014). Social familiarity and routine activities in daily life also create interest and engagement in such apps (Verenikina & Kervin, 2011). Furthermore, app content, prior experience of a child, and sustained interest retain a positive and strong relationship with their cognitive level (Neumann & Neumann, 2014).

Finally, the process further screened the selected apps from phase 1. The reading capability was the most significant feature. The selection process included only non-reading capability apps because the exclusion of reading capability facilitates the engagement and learning of children. As a result, phase 2 finalized only 20 apps after the completion of evaluation in the phase.

Phase 3: Examining the Characteristics of Educational Game-Based Design

Phase 3 evaluated the remaining 20 apps against the benchmarks of educational game design. The benchmarks included the characteristics, such as interest, rewards, and engagement.

Designing an educational game must ensure the features, such as social skills, curiosity, and fun, attract the attention of child users . Music and animation remain two primary characteristics that encourage child users to play an educational app, as they create interest and ensure engagement. Attractive designs also lead users to educational gaming apps that include both sound and music effects, but offer no learning aspects during play (Rideout, 2014; Stipek et al., 1998).

Fundamentally, an app with diverse characteristics (i.e., sound, music, animation, and touch screen) becomes a learning platform for child users (Israelson, 2015). As a result, learning, fun, and interactive engagement remained the primary characteristics employed to assess the usability of the apps in phase 3.

The reward-promoting characteristics of an app must have a positive relationship with the satisfied feelings of a child user. Tokens are available for those child users who complete a stage or level in an app, highlighting the behaviorist strategies that promote constructive reinforcement through reward mechanisms.

This strategy leads to the primary goal of identifying and selecting a relevant app, and that is to enhance their learning by using exploration as their primary activity source. In other words, fulfillment and satisfaction become more achievable and self-sustaining through the application of exploration activities rather than utilizing the reward system. The primary drawback of the reward system is that it does not enhance their learning skills but focuses on their economic or financial rewards within an app.

More specifically, intrinsic rewards are more motivational than extrinsic ones because they suppress manipulation and encourage exploration and motivation for this age group (Verenikina et al., 2010). Consequently, the researcher added those apps that promoted intrinsic rewards and increased their interest in learning new things in life through exploration.

The researcher examined the selected app in phase 3 by assessing their ability to increase the tendency towards academic learning. The process discarded fun-promoting apps as they failed to satisfy the benchmarks. Finally, this phase selected 13 apps.

Phase 4: Evaluating Pedagogical Soundness for Early Childhood Language Learning for ESL Learners

Phase 4 evaluated the characteristics of the selected apps against the early childhood language development pedagogy for ESL learners. The inclusion benchmark for an app used in this study was the characteristics of apps that supported language development, including comprehension, syntax, user-friendly language, verbalization, and new age-specific and subject-specific words.

The primary objective of this study was to identify apps that offer language development for secondary English language child learners. Consequently, the researcher included the related apps that supported ESL objectives. Fundamentally, an app must use simple and understandable language that can motivate child users to engage in reading and using the app. New words and correct usage were the two benchmarks the researcher applied to shortlist apps, as they provide a digital platform for learning English and their new vocabulary. Consequently, this benchmark was used to select an app.

The user language of an app must accommodate and facilitate child users to apply its vocabulary easily. Potential child learners come from diverse socio-economic backgrounds; consequently, they need understandable and easy vocabulary and language use in apps. An effective and useful app provides everyday-used vocabulary, words, and sentences, including social and academic images in engaging activities (Harris et al., 2015).

An app becomes academically useful if it contains socioeconomic and cultural stories and activities encompassing fun and entertainment for child users (Nemeth & Simon, 2013). Subsequently, an app becomes academically relevant when it promotes local culture, traditions, and ethical values, including global citizenship and global social harmony (Hillman & Marshall, 2009). In other words, an educational app must provide new knowledge and include new experiences for child users (Marsh et al., 2015).

Verbalization is another benchmark used to select an app. Accuracy, app map, and content must be relevant, including clear and understandable pronunciation and spelling (Israelson, 2015).

Interactive and digital apps, which utilize communication tools and digital devices, often attract the attention of child users as they remain successful in attracting and retaining the attention of young users (McKenzie et al., 2018; Stern, 2014).

The role of dual-code theory remains the most effective as it insists that information retention occurs when numerous channels show the same data repeatedly (Paivio, 1986; Baddeley, 1986). However, the argue that information retention becomes challenging when audio and video aspects of a piece of information require collective focus from young users. In other words, children learn more quickly when they simultaneously hear and watch the same words than when they have only one option, either listening or watching words (Schnotz, 2005).

This aspect indicates that learning ESL is a comprehensive process, as it requires young learners to apply both visual and listening abilities to learn new academic knowledge, especially using digital books and other sources .

In addition, story apps and digital books fail to generate relevant stories for young learners, making it increasingly challenging to continue focusing on digital stories and book-based moral lessons. Consequently, cognitive disruption occurs when a child frequently experiences focus deficit problems (Sweller, 2005).

The language of educational apps must include everyday life vocabulary. Children learn more about their routine life and daily vocabulary when they hear new words and sentences from educational apps. The relationship between app language, activities, and the daily routine life of children must be clear and strong, enabling young users to understand the meaning and context of everyday vocabulary and sentences. In addition, class teachers can further solidify the language of children by discussing new words, their pronunciation, and usage in developing sentences about routine life, particularly after hearing new words or sentences from an educational app.

At the end of four phases, the study selected only six apps that sufficiently completed the selected benchmarks highlighted in the sections. They were: Go-Togethers, Starfall, Go Sequencing, Peg and Pog, New Early Reading Quiz Games, and Kidlo Bedtime Stories For Children. The shortlisted apps support the development of secondary language, words, sentences, meanings, and daily use for children.

***Compareting the Six apps Against Criteria:***

Table 3.2 summarises the results of the comparative evaluation of the six selected apps.

**Table 3.2** ***Comparative Evaluation of Selected Apps***

| Inclusion Criterion | Starfall | Go-Together | New Early Reading Quiz Games | Go Sequencing | Peg and Pog | Kidlo Bedtime Story |
|---|---|---|---|---|---|---|
| **General Features** | | | | | | |
| Aim | Open-ended; there is no specific goal for the child to attain at the end of the activity. | Closed; specific outcomes; select right answers; pre-programmed (answers to questions are pre-set). | Closed; specific outcomes; select right answers that have been pre-set. Teacher can engage children in conversation about the object; pre-programmed. | Closed; specific outcomes; putting events in the right sequence. Some activities offer open-ended features whereby the children can create their own sequencing/story and record their voice, and the teacher can insert the text. Pre-programmed. | Closed; pre-programmed answers. However, children can select the setting with its relevant vocabulary and talk about it with peers/ teachers. | Story app; pre-programmed. |
| Target market | This app is specially designed for young learners to develop their literacy, language and maths skills. | This app was designed for a wide market, from young children to older individuals with language/speech needs. It can be used in early childhood settings and for special needs education. | This app is designed with young learners in mind to help them improve their oral language and vocabulary. | This app was designed for a wide market, from young children to older individuals with language/speech needs. It can be used in early childhood settings and for special needs education. | This app is designed for children from early childhood to middle childhood stages who enjoy reading and imagining stories. | This app is designed to help young learners develop their reading and listening skills. |

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|---|---|---|---|---|---|---|
| Price | Several activities are free but full content entails an annual membership fee of AUD $70. | AUD $17.99. | Free | AUD $38.99 | AUD $5.99 | AUD $6.49 for one month; AUD $24.49 for six months; AUD $40.99 for one year. |
| Reviews/Awards | Developer claims It has been reviewed and recommended by Common Sense Media for early literacy and language learning with an 'excellent' rating of 5 out of 5 stars. | Online reviews by speech pathologists gave very positive feedback based on using the app in clinical settings. | No reviews located. | Online reviews by speech pathologists gave very positive feedback based on using the app in clinical settings. | Multiple reviews and awards: Editor's Choice, Children's Technology Review; All Time Best, Children's Technology Review; Parents' Choice Award 2019; 5 Star Award, Educational App Store; Teachers with Apps Certification Award 2018-2019. | No reviews located. |

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|---|---|---|---|---|---|---|
| Individual or Group Activities | Users can play individually or collaborate on some activities by taking turns. | The teacher selects an appropriate setting for individual children and the app tracks his or her individual progress. Children can collaborate by taking turns or playing as a group if the teacher does not want to receive a progress report for each child. | Users can play individually or collaborate on some activities by taking turns or playing as a group. | The teacher selects an appropriate setting for individual children and the app tracks his or her individual progress. Children can collaborate by taking turns or playing as a group if the teacher does not want to receive a progress report for each child. | Users can play individually or collaborate on some activities by taking turns. | Users can play-listen individually or collaborate in the stories by taking turns. |
| Language/s | English | English | English | English, Spanish, Portuguese. | English, French, Mandarin, Spanish, Portuguese. | English, Spanish, French, Mandarin. |
| **Features Relevant to Early Childhood Education** | | | | | | |
| **Child-friendly navigation** | **Yes** | **Yes** | **Yes** | **Yes** | **Yes** | **Yes** |
| Customised, individualised activities | Activities can be individualised according to the child's own pace and ability level. | Activities can be customised according to the child's own pace and ability level. | Activities can be individualised according to the child's own pace and ability level (easy-hard). | Activities can be customised according to the child's own pace and ability level. | Yes, there are variety of activities. | There are variety of stories from which the child or teacher can select (by clicking) according to the children's interest. |

| | | | | | | |
|---|---|---|---|---|---|---|
| Sound and music options | There is an option for listening to the words or turning the sound off. | The teacher can choose the kind of feedback the child receives; e.g., a voice saying "Try Again" or a buzz for an incorrect answer. | There is an option for listening to the sentences or turning the sound off. | The teacher can choose to turn the instruction audio on or off depending on whether or not the child can read. | There is an option for listening to the words or turning the sound off. | The music can be turned on or off before the story is read. |
| Multiple language options | English only. | English only. | English only. | English, Spanish, Portuguese. | English, French, Mandarin, Spanish, Portuguese. | English, Spanish, French, Mandarin. |
| Multiple levels | Children can move up after mastering each level. | The teacher can select the level of difficulty. | The child can move up to the hard level after mastering the easy level. | The teacher can select the level of difficulty. | Each setting is associated with different vocabulary words. | Children can choose another story when one is finished. |

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|---|---|---|---|---|---|---|
| **Presence of gender or ethnic bias: tendency to favour one gender or culture over another as seen in the context of the themes of the app.** | **None** | **None** | **None** | **None** | **None** | **None** |
| Quality of visuals and sounds | High quality | High quality | High quality | High quality | High quality | High quality |
| Maintenance of child's interest over a period of time | Play-like format based on learning theories makes it fun for the child to discover the features of the app. | Because items are grouped in familiar categories, children feel confident in their knowledge and are motivated to continue. | The objects are familiar to children so their interest is sustained as they feel confident in their knowledge. | The sequences are based on common children's experiences so they can anticipate the right order of the sequencing. Familiarity with the sequences sustains their interest as they feel confident in their knowledge. | Because items are associated with familiar environments children feel confident in their knowledge, their interest is sustained and they are motivated to continue. | The play-like features and children's familiarity with the story concepts sustain interest as they feel confident in their knowledge. |

| **Reading ability required** | **No** | **No** | **No,** | **No. Written text is read aloud by the app.** | **No** | **No** |
|---|---|---|---|---|---|---|
| **Features Related to Educational Game Design** | | | | | | |
| Appeal to Children | The animation is attractive to children because it is whimsical and funny. | The graphics are clear and there is some action. | The animation is attractive to children because it is whimsical and funny. | The graphics are clear and there is some action. | The animation is attractive to children because it is whimsical and funny. | The animation is attractive to children because it is whimsical and funny. |
| Features for encouraging and rewarding success | Animation and sounds. | There is a choice of visual or aural feedback for an incorrect response (a buzz or "Try again"). | Animation, sounds and rewards. | Rewards for correct answers | There are cues on how to play the games. | There are cues on how to use the app and play the game. |
| **Features Relevant to EC Language Development Pedagogy for EAL/D Learners** | | | | | | |
| Ease of Understanding/ Clarification of meanings of certain words | Since it is designed to improve vocabulary, the app uses simple language and explains new vocabulary words. | Yes, it helps clarify meanings of words through associations of things. | Yes, the app uses simple language and explains new vocabulary words and shows the picture associated with the target word. | Yes, it helps clarify meanings of words through the association of words/sentences with clear pictures of the story/sequencing. | Yes, since it is designed to improve vocabulary, the app uses simple words and associated pictures help to clarify their meaning. | Yes, since it is designed to improve listening skills, the app uses simple language and explains new vocabulary words in meaningful context. |

| **Child-friendly and accurate language** | **Yes.** | **Child-friendly language is used to elicit the child's response (naming the item).** | **Yes.** | **The language and vocabulary are child-friendly and familiar from everyday life.** | **Yes.** | **Yes.** |
|---|---|---|---|---|---|---|
| Encourages verbalisation of words | Yes. The child can repeat words or sentences following a model of correct pronunciation. | Children can express themselves through words. | Yes. The child can repeat some words or sentences. | Yes. Children can re-tell the story following a model of correct pronunciation. | Yes. The child can repeat words following a model of correct pronunciation, but not in sentences. | Yes. The child can repeat words or sentences following a model of correct pronunciation. |
| Features for Vocabulary Building | Several meaning-making activities help to build vocabulary knowledge. | By associating items that go together the app provides opportunity for the child to name the object and develop the meaning of the new vocabulary word. | Some meaning-making activities are available to increase vocabulary knowledge. | Several meaning-making activities (short stories) help to increase learners' vocabulary knowledge. By ordering and retelling an illustrated short story, the learner develops a concrete image of new vocabulary words. | The various environments include some vocabulary learning in the form of individual words. | Several meaning-making activities (stories) help to increase learners' vocabulary knowledge. |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mastery of New Vocabulary Words | Yes. These are incorporated into the activities. | Yes. There is opportunity for this when the teacher pauses to discuss the words and meanings. | Yes. These are incorporated into the activities. | Yes. These are incorporated into the activities. There is also opportunity when the teacher pauses to discuss the words and meanings and also when the child re-tells the story. | Yes. The app introduces the words in the relevant environment. Teacher can discuss the words with the child/children before moving to the next activity. | Yes. These are incorporated into the activities. |

The following section provides a description and analysis of the six apps in relation to its suitability as learning tools to support the language development of young ESL learners.

***Review of the Starfall Application:***

The Common Sense Media site provides Starfall five-star rating as it includes only highly relevant and effective characteristics to read and engage children quickly and easily (Common Sense Media, 2019). The site has various kinds of reviewers who have identified and verified the efficacy and user-friendly applicability of the app. For instance, parent and child reviewers have given a four-star rating, indicating that they want to learn ESL and improve their English vocabulary and usage. Consequently, this assessment justifies the selection of the app as it includes all benchmarks that are highly effective in ECEC and the development of pedagogy for ESL students. All images are given in the Appendix A.

The app includes highly essential elements for obtaining the learning objectives for children. For instance, the Starfall library contains all digital storybooks that provide an opportunity to learn about various academic activities and routine life chores, as they help improve English vocabulary, sentence use, sentence development, interactive media communication skills, animated characters highlighting English usage, and new terms for learners. Specifically, picture books are just one example of an app that shows how to apply English words and sentences, along with animated pictures and sentences, providing a comprehensive context for child learners to read and understand English.

All images clearly indicate the relevance of content for child learners. Each image has distinctively specific content features that motivate young language learners to learn English using unique options available to them. For instance, image 1 depicts animations, mathematics, vocabulary, and digital books for Kindergarten and pre-k students. The primary benefit of using animation is that it attracts the attention of children and encourages them to select one book and start reading it.

Specifically, the site uses human, animal, and other forms of animations to display the message in English. Digital learning is a new way to learn languages and communication skills (Carrier et al., 2017). However, this learning process depends on the efficacy of digital content and sources used by teachers for improving the learning of young learners (Chen et al., 2016). Still, the impact of digital books on learning is that they enhance learning and understanding of English, particularly vocabulary and sentences for non-native learners (Fariba et al., 2019). In other words, sources, such as websites or apps, are highly effective, particularly for ESL learners, as they consider the features of users and accommodate them while building an ESL app (Guaqueta & Castro-Garces, 2018).

Image 2 represents English sentences and their practical usage in real life. The image says, “Some things smell nice.” And “Other things do not smell nice.” A closer analysis reveals that the image also shows how two girls prepare cookies, and their smell feels good. In contrast, the smell from garbage is awful, enabling young English learners to maintain similar behaviors and words when they encounter similar situations. In addition, this image is the practical display of the app used by the Starfall website, as the arrows in green color lead to subsequent slides where a user can see other similar descriptions and their practical demonstrations. This type of interaction between English learners enhances their cognitive skills (Hmidani & Zareian, 2022). In other words, learning has become an art that requires the support of all available digital and non-digital sources (Lim, 2021; Lim & Toh, 2022). The primary benefit of this teaching strategy is that it motivates learners to maintain consistency and engagement with digital content they use to develop their skills and understanding of foreign languages (Liu & Chu, 2010).

The Starfall app is also a type of vocabulary builder platform that encourages ESL learners to use such vocabulary apps (Ludwig, 2018). Particularly, English language and related educational apps have increased the focus of learners as English has become an international language (Macaro et al., 2012).

Image 3 also highlights the significance of storytelling and vocabulary building. It shows a teddy bear holding a basketball and shares information about the ball and its movement.

Image 4 demonstrates the relationship between text, vocabulary, and a game. It allows child users to play a game after clicking the highlighted button.

The Starfall offers numerous advantages for young learners. Language development occurs because the app encourages conversations, activities, and information-sharing with peers and friends (Marsh et al., 2015). This aspect reveals that the app not only focuses on providing entertainment to young ESL learners but also includes numerous strategies that can help users develop language skills.

Overall, the primary benefit of this evaluation is that it provides a comprehensive understanding of educational apps that can enhance vocabulary, sentence structures, and stories within the same app. In other words, the Starfall app has both learning material and entertainment dimensions, both of which are highly effective for child ESL learners.


*Figure* Starfall home page.

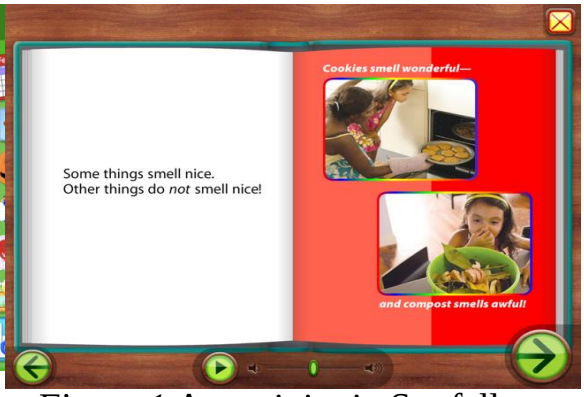



*Figure.1* An activity in Starfall focusing on vocabulary.


*Figure.2* A story in Starfall focusing on the letter sound 'b'.


*Figure 3* Starfall can highlight text as it is read.

Starfall introduces new words during stories being read aloud by the app (Figure***.2*** and Figure ***3***). The action depicted on the screen (Figure***.2***) helps young children to understand the meaning of the words. This activity can also facilitate conversations among young children during or after listening to the story. For example, in the short story for the letter 'j', the child can count the number of jumps (a word that starts with the letter 'j'), and the educator can ask questions. For example, "What do we use to jump like this?" and "Can we use something else?" Such opportunities for involvement in conversations, actions and knowledge-sharing are valuable for language development (Aldossary, Curwood & Niland, 2021; Marsh et al., 2015). Starfall encourages children to learn problem-solving skills, express their own ideas and accept and integrate others into their play, all of which foster learning in young children (Aldossary, Curwood & Niland, 2021).

Starfall's activities can enhance vocabulary skills and meaning-making by associating images, sounds and meaning. The child learns to make sense of the sentences, associate spoken words with visual images or animations, or learn rhyming words. When the sound icon is turned on, the app reads the sentence as it highlights the words being read (Figure ***3***).

Educators can take the opportunity to ask questions to check understanding. By engaging children in activities that encourage them to be curious and active social learners, these features of Starfall can support children's confident and encourage them to involve in the learning (Saudi National Curriculum Framework [SNCF], 2018).

Educators can select from a list of levels arranged by language-learning stage to identify a developmentally-appropriate activity for a child. The levels range from a basic understanding of letters, their sounds and associated words to advanced elements such as story-reading and comprehension. This feature meets the criteria for features related to the principles of educational game design. The visuals and sounds have been designed to sustain the child's attention, and easy-to-follow directions spoken in the app allow the child to navigate the different activities. The child can touch an arrow or ear icon on the screen to go to the next page or listen to the instructions or story. These features engage the child's attention and result in meaningful learning, sustained even after playing has finished.

In summary, Starfall met all the criteria established for this evaluation, which suggested it had the potential to enhance a child's vocabulary and meaning-making skills and, if shared with other children, to build social and communication skills. Educators can also supplement in-app learning by questioning the child about what they are watching and hearing to support their language learning.

***Review of Go-Together:***

Go-Togethers is an educational app developed by Smarty Ears, a technology company specialising in the creation of high quality technology for speech, language and communication . The developers claim the Go-Togethers app designed to help users from all age groups to improve their language comprehension and language expression skills. It has been designed for use by young children and adults who are learning English as a second language and as a development assessment tool for individuals with special language needs.

The creators claim that this app helps to extend vocabulary and critical thinking skills through tasks that require the user to make associations between items that are semantically or functionally related and which are grouped into familiar categories such as vehicles, food or animals (App Store Preview, 2020). Users know immediately if they have responded correctly through visual and auditory feedback. For example, a signal flashes on the screen for a correct answer, while an incorrect answer elicits a cue to try again.

The app also provides an option for expressive language development. This feature allows children to practice new words or correct their grammar by explaining orally why they answered as they did. The app tracks the user's performance, records the scores and provides a detailed report that can be sent to collaborating teachers or therapists working with children with special needs. English language learners who need training in their vocabulary, association and communication needs may benefit from playing with this app.

It has been designed to be user-friendly and can be customised in terms of level of difficulty. Teachers and therapists can target items in different categories where their students' vocabulary and word retrieval need improvement (App Store Preview 3, 2020). The teacher can adjust the settings of the pre-programmed game in the Settings Room (Figure 3.5).

Games can be customised according to level of difficulty, the number of choices from which users can select (and the number of correct choices), which item goes with something within a category, and the type of response that is received for a wrong choice. Three different settings modes are available: 'receptive', 'expressive' or 'alternating receptive-expressive'. Receptive mode is used for choosing the items that go with the target object (Figure 3.6). In expressive mode, the app asks the child what goes with something and the child provides an answer. The teacher clicks on the "I said what" icon for each answer and on the 'I said why' icon when she asks the child to explain each answer (Figure 3.7). These features allow the user to retrieve associated items as accurately as possible and express their reasons for their choice, and provide a means to check if their vocabulary knowledge has improved (Idris, 2024).

A unique feature of this app is the availability of a report on the user's performance which can be printed out to monitor his or her progress.

Go-Togethers has been positively reviewed by teachers and speech therapists. Speech pathologists have commented favourably on many of its features. These include: the variety of options available to customise the game to users' needs, the appropriateness of the concepts and vocabulary for different levels, the ability of the app to track the user's development; the availability of different response selection methods (drawing the items that go together or just tapping the correct match); the ability to pause the app to discuss users' responses, help them to digest what they are learning, and avoid overstimulation (LaCour, 2013; Manchester (2012). Although the aims and purposes of speech and language therapists may differ from those of teachers who work with children who have no developmental difficulties, these features are equally relevant in regular ECEC settings.

However, the Go-Together app has several limitations. First, the number of activities it offers is limited. Young children may become bored if they are unable to exercise choice in the selection of activities (Breathnach, Danby, & O'Gorman, 2017). Second, there is no end point of the game; when the child wants to stop, they have to press the 'Done' button. Third, the use of graphics or cartoon-like pictures instead of real images may be problematic for users who are not familiar with the items from their own experience. It can also avoid images that may be racially specific. Fourth, young children who are not native English speakers may find it difficult to identify the names of the items in English. Finally, the app does not allow the child to listen to the names of the items before making their selection.

Some of the pictures are culture-specific. One question, for instance, asks ‘What goes with the White House?’ Children from countries other than America would be unlikely to be able to answer this question. Some other questions might be hard for some children to understand because they lack the relevant experience; for example, ‘What goes with homework?’ As Verenikina and Kervin (2011) have observed, an app that aims to promote children’s learning should ensure that its activities relate to recognisable concepts in their daily life.

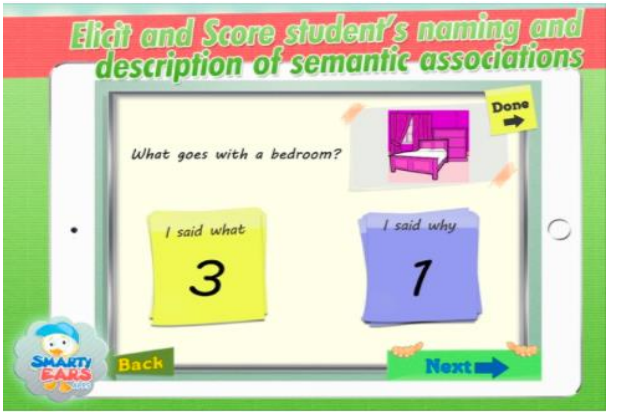
The expressive feature may also be complicated for young children if they do not have enough English vocabulary words, as there are no visual hints or cues on the screen and only limited time is available to discuss the answers with the teacher. The app has no provision for promoting social interaction through, for instance, discussing some questions together or playing the game as a team or as competitors. Although more than one child can use the app at the same time, each has a pre-programmed game set by the teacher. This is not consistent with the principles of sociocultural learning, which encourages playful interaction with others (Roskos, Burnstein, Shang & Gray, 2014). As such, the app does not support children to connect with and contribute to their word (Saudi National Curriculum Framework [SNCF], 2018).

In summary, the Go-Togethers app is designed to enhance young children’s matching and classification skills. With regards to the criteria set for this study, the first one on the general features of this app allow children to speak up and develop their reasoning ability and allows the teacher to select the navigation settings that best suit the needs of different children. The second criteria relevant to Early Childhood Education goals, does not promote social interaction with peers, although it stimulates children’s cognitive development. The third criteria pertaining to language development seems to be met by this app, as it helps in the vocabulary development of children. Finally, with regards to appropriately reflecting qualities suitable for educational game designs, this program exhibits several features that allow children to engage in game-like activities, as they advance in their level of difficulty.

**Figure 3.4 Settings room.**


**Figure 3.7 Expressive setting mode.**


**Figure 3.5 Receptive setting mode.**




## *Review of New Early Reading Quiz Games App:*

The New Early Reading Quiz Games app aims to strengthen children's reading skills, oral language and vocabulary development in English by encouraging them to read out loud and listen to words and sentences(Geist, 2014; Marsh et al., 2015) (Figure 3.8). The app offers engaging graphics and vocals that allow children to guess the object being described. Although the main objective of the game is to promote literacy and reading, the developers claim that it also teaches oral language as children learn words, their meanings and their correct use in sentences (Appgrooves, 2020).

Users can increase their vocabulary by listening to sentences that describe various objects. The vocabulary words represent familiar items such as food, animals, and transport. The app is pre-programmed with activities at two levels of difficulty, easy and hard, from which the child can choose (Figure 3.9).

At the easy level, the child listens to some descriptive sentences for a certain object (Figure 10). The language is simple and easy to understand for those who are learning English as an additional language. The child can discuss the text with the teacher and classmates, providing opportunity for them to share their ideas about what the object is before they click on the 'next' button. The following frame presents a silhouette of the object and a list of choices (Figure 3.11). Young children may require the help of an adult to read the choices for them. When a wrong choice is tapped, the app says so, an 'x' and a sad face appear on the screen, and the wrong answer is removed (Figure 3.12). The user has the option to go back to the previous frame to listen again and a different set of choices is presented (Figure 3.13). Once the correct answer is tapped, the app provides immediate feedback, saying it is correct, and a check and a happy face appear on the screen (Figure 3.14). The correct word is left with the silhouette of the object (Figure 3.15). Each time the child guesses correctly, a star sticker is added to her screen as a symbol of her accomplishment. Clicking on the green button with the forward arrow allows her to resume the game with a new word to guess. After three rounds, the app begins to repeat the same descriptions. Such repetition and the limited variety of words to guess can lead to boredom and loss of interest in the game.

The hard level presents a new challenge. The child is expected to read on her own if she can. This feature has limited relevance to the study's purpose as the target participants are not yet readers, hence, this hard level may not be suitable for them as it focuses more on reading ability. An option it offers is for the child to tap on a button and the app reads the sentences for her. The silhouette of the object being guessed is replaced by a black oval. If more than one child is playing the game, they can discuss what they think the object is if they need to.

The process that follows a correct or incorrect answer is the same as that for the easy level. Once the child works out or is shown what the settings can do, he or she can easily navigate the game.

The level of difficulty can be adjusted and the number of sticker rewards can be checked. There is an option for changing the cues from which the object is to be guessed: the descriptions can be read or listened to the descriptions and the music can be modified.

This app appears to be based on a behaviourist approach, as it reinforces children's responses with rewards in the form of tokens. Although they may learn new words and improve their reading skills, it is more developmentally-appropriate to provide young children with exploration and discovery activities that are not dependent on external rewards.

The goal should be learning something from what they discovered. This should be the reward itself because of the sense of fulfillment they derived. The format used by this app is more teacher- and app-initiated, setting boundaries on what children should learn.

In summary, this commercial app that uses behaviourist/transmission theories to reward accomplishment and progress (Lynch & Redpath, 2014). Although it can develop children's vocabulary and knowledge of phonetic sounds, users are considered as recipients of "narrowly defined literacy knowledge rather than as creative producers of original materials" (Flewitt et al., 2015, p. 297). It is not necessarily a waste of time engaging in this app, but it does not fully maximise young children's cognition.

Constructivist approaches such as those of Piaget and Vygotsky would recommend greater emphasis on play, discovery and exploration for young children's learning, on their own and with others (Edwards & Cutter-Mackenzie, 2011). Ideally, learners have the freedom to learn by actively exploring, asking questions and collaborating with others. However, the app limits discovery learning because it is pre-programmed and the game needs to be set up by the teacher or other adult. Progress is determined by the rewards the child receives for correct answers.

Such progress may not necessarily demonstrate that the child has understood the clues and is simply motivated to get a happy face instead of a sad one. This app, however, does little to facilitate imagination and limits learning of language and vocabulary skills to prepared texts and fixed responses. Child users are not free to explore more ideas and words on their own. Because this is a free app, it hosts pop-up ads which can be distracting and may cause the child to lose interest in the game.

In summary, the New Early Reading Quiz Game was designed to enhance young children's early reading skills, including comprehension and vocabulary development. Although its features are very basic for young learners, it has some potential as a tool for supporting children's English language, and can support interaction when children use it together. At best, the novelty of being digitally rewarded for correct responses can engage children's attention, but the purpose of this research goes beyond that. Hence, it does not meet the standards sought for this study.

**Figure 3.8 New early reading quiz games activity samples**

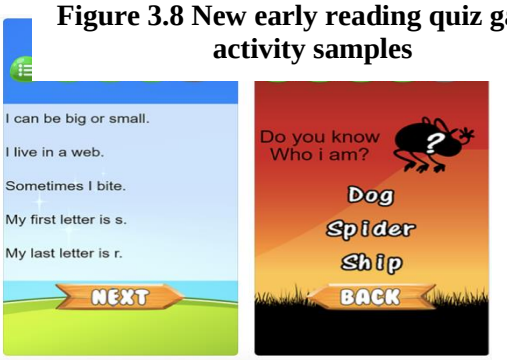



**Figure 3.9 Levels of**


**Figure 3.10 Describing the object**

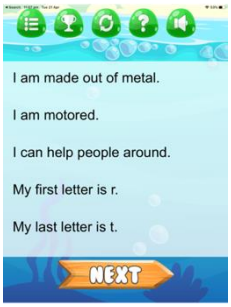



**Figure 3.11 Guessing the object**

**Figure 3.12 Wrong choice 1**


**Figure 3.13 Refilled**


**Figure 3.14 Correct answer**


**Figure 3.15 Hard**


## *Review of Peg and Pog App:*

This app features two children named Peg and Pog and their cat Cosmo who go on various adventures while interacting with the children playing with the app (Figure 3.16). The developers describe it as an award-winning game that enhances language learning for young children (Educational AppStore, 2020). It won the 'Teachers with Apps Award' because of its "appropriate role models, the inclusion of diversity and engaging interactivity" (Clare, 2020). It offers eight different play environments from which the child can choose. Peg and Pog are brought to the selected location wearing appropriate clothes for the setting (Figures 3.17, 3.18).

They are then exposed to new words to learn. They need to listen for the name that matches the graphics and press on a red spot to keep moving, collecting pictures of the objects they guess correctly (Figure 3.19). They are also able to explore the environment by playing with objects within it and learn their meanings. At the end of the journey, they are rewarded by an avalanche of stars (Figure 3.20). They also have the option to go back and review the words by tapping on the relevant picture, and the word will be spoken. If they opt to go to the next environment/activity, they can tap on the book icon on the top corner of the page. On the homepage, the environments they have already completed will be shown with a star to mark their accomplishment. From this description alone, it would seem very engaging for children because of all the play-like elements the app offers. It provides several opportunities for discovery learning as children explore various environments featured while enhancing their vocabulary.

With regards to expanding their vocabulary, this app provides numerous opportunities for children to expand their vocabulary and, since it is available in different languages, it can expose them to a second or more languages. The graphics and sounds are clear and easy to decipher. Users encounter surprises along the journey that help to keep them engaged (Educational AppStore, 2020). The app conforms to the learning-related , namely, that it should promote active, involved learning; engage children with the learning without distractions; provide them with meaningful and relevant experiences; and allow for social interaction with others. It can be said that the app adheres to socio-cultural learning theories.

Children can navigate the app easily, and the places and words are familiar to them from their everyday experience. This makes it easier to associate the pictures with the words. It is consistent with the recommendation that apps for early childhood should include visual, auditory and interactive elements that are enjoyable and relevant to the target audience (McKenzie et al., 2018; Stern, 2014). The environments shown in Peg and Pog are also considered safe in the context of Internet use (Livingstone & Smith, 2014).

On the downside, children might become bored by repetition, as words are introduced one at a time and are not used in sentences to create the proper context. Boredom is usually caused by a lack of challenge and the wrong level of difficulty. Children easily lose interest when the game does not challenge them enough, hence, boredom can set in. If they encounter activities that are not within their 'zone of proximal development' their interest and attention can waver (Vygotsky, 1978). As Neumann and Neumann, 2014 suggest, children's interactions with apps should be shaped by their prior experience as well as alignment between the content and their own developmental level.

Although the app was intended for individual use, it can also be used with a group. Teachers can facilitate discussion about the words that appear on the screen and extend the conversation by asking the children to describe previous experiences associated with the word. In this case, it supports socio-cultural learning.

In summary, Peg and Pog features adventures that would appeal to children as they develop learning skills, including vocabulary development. It provides opportunities for them to use their imagination as they pretend to travel with Peg and Pog through different scenarios, which expose them to a wide variety of words. However, over time, children may get bored with the app especially if it just keeps repeating information and does not challenge their abilities enough.

**Figure 3.16 Peg and Pog**

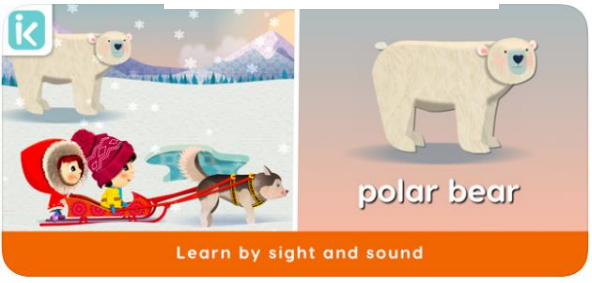



**Figure 3.17 Environments in Peg & Pog**

**Figure 3.18 Example of**

**Figure 3.19 Example of word to identify**


**Figure 3.20 Avalanche of stars when the child finishes a journey**

***Review of Kidlo Bedtime Stories for Kids:***

Kidlo Bedtime Stories for Kids is a picture book app, the developer claims that this app seeks to encourage children to read and enhance their imagination and vocabulary skills. A winner of the 2019 'Mom's Choice Gold Award', it is described as appropriate for toddlers to five-year-olds who love storybooks (App Store Preview 1, 2019).

The promotional material claims that the app expands learners' understanding of the vocabulary while they listen to and view picture books. The digital interactive storybooks introduce vocabulary words on different topics (Figures 3.21, 3.22). Young users are offered two options, namely "Read by myself" or "Read for me" (Figure 3.23). Both options expose children to the sounds of the words and how they are pronounced as well as what the words mean in relation to the stories. This feature enhances children's vocabulary skills.

As the stories are read, the words under the pictures light up to facilitate children's association of a word with its sounds and pronunciation. As such, it provides an opportunity for non-readers to be exposed to the reading experience. The child can generate a response from the characters by clicking on them, which increases their engagement and enjoyment. At the end, the child hears the moral of the story. This presents an opportunity for the child to discuss the story with the teacher or with other children, thereby enhancing vocabulary and meaning-making skills as well as building social and communication skills. After each story, two options are presented: repeat the story or go to the main page by clicking on one of the buttons (Figure 3.24).

Adult-child interactive storybook reading captures children's interest and sustains their attention, as well as forming a bond between the adult and the child (Massey, 2013). Shared stories allow teachers to link the events to children's experiences and encourage them to narrate it to class (Dickinson, 2001; Halliday, 2004). Kidlo Bedtime Stories for Kids seeks to simulate this in digitalised form. The stories are suitable for children in ECECs as they are familiar tales they can relate to (Verenikina & Kervin, 2011).

The app also aligns with (Saudi National Curriculum Framework [SNCF], 2018) children access information, explore concepts, and express their thoughts through the use of information and communication technologies. It exposes users to literacy-rich media as they listen to stories or try to read the story themselves with the help of prompts. The experience of reading and understanding the story themselves is both enjoyable and confidence-boosting (Hogan et al. 2011; Massey, 2013; National Early Literacy Panel, 2008). Through listening, they can develop comprehensive language skills, such as the use of syntax, the rules in grammar, and semantics. By composing stories, they coordinate these language skills and develop narrative abilities ( Massy,2013). One weakness of this app, is that the audio of the reading voice tends to go fast when reading the story, making it quite difficult for some children to follow especially if they are not well-versed with the language yet.

In summary, Kidlo Bedtime Stories for Kids is an interactive story book app for young children to develop comprehension, imaginative thinking and vocabulary skills as they read or listen. It readily engages children through colourful graphics, interesting activities and relatable and familiar stories from which they can choose. It can be a viable learning tool for young children to learn from, however, it is still limited in terms of possibilities to widen their skills and knowledge in the target language.

**Figure 21 Kidlo Bedtime**


**Figure 22 Choices of Topics**

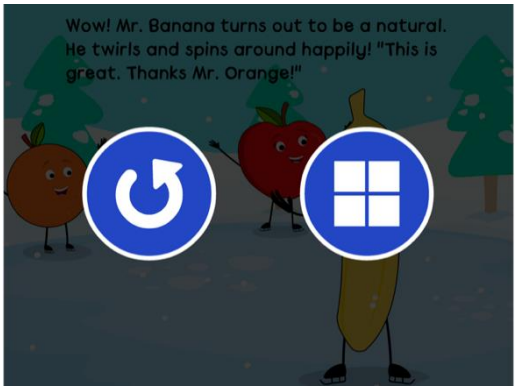
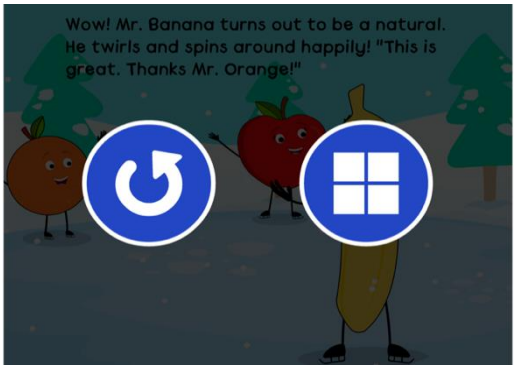



**Figure 23 Reading Options**


**Figure 24 Options at the end of a story**



### *Review of Go Sequencing App:*

The Go Sequencing app was designed by a certified speech-language pathologist to help children learn how to sequence events correctly in story form. The winner of an Academics' Choice Award as an effective learning tool (Academics' Choice Awards, 2020), it is available in three languages—English, Spanish and Portuguese. The developers claim that the app teaches the fundamental skills needed for language comprehension, narrative re-telling and reading comprehension .

Sequencing is a skill that involves the identification of the components of a story (beginning, middle and end) and its retelling in the proper order. It is a critical aspect of story comprehension as children need to understand what happened in order to explain what is currently happening and predict what can happen in the future. It is essential for children to learn how to organise their thoughts when they express their ideas so that what they communicate to others is clearly understood. Go Sequencing offers a wide range of sequencing opportunities with themes relevant to children's lives (Figure 3.25).

Children can progress through several levels that offer more challenging activities (Figure 3.26). In level 1, the child is asked to identify the events that happen first or last by listening to a short sequence narrative. When a wrong choice is made, a voice in the app says "Let's try again" and a brown a brown star appears. If a correct choice is made, the voice says "Well done" and a gold star appears. When the child has accumulated 10 gold stars she can move up to the next level.

In level 2, stories with 3-step sequences are presented with images, audio and text, and the child is expected to drag the images into the correct order (Figures 3.27 & 3.28). As the child progresses to more challenging levels, more steps in the sequence are added, and images are replaced by text (Figure 3.29). For example, Level 6 includes 4-step sequences with both images and text. After listening to the story with the pictures, the child is asked to drag the text without pictures in the right sequence order (Figure 3.29).

Non-readers can tap on the text and hear what it says. It is important that apps developers consider the growing level of difficulty of the activities to suit children's expanding skills.

Go Sequencing offers several customisation options in addition to the selection of a preferred language. Sequences can also be manipulated by adding or removing items, or choosing when the app moves to the next screen. Children are also able to add their own photos of events in their lives. The teacher or child can record an oral account of the event and the teacher can type what the child says. This is an example of active learning as the child participates in the experience. Young children need to be more actively engaged so they know that they are responsible for their own learning experiences. Feeling that they are in control of their learning gives them more ownership of the learning experience which can be very fulfilling for them.

A valuable feature of the app is the immediacy of feedback via the changing colour of the stars (Stern, 2104). Feedback in visual, aural or oral format is important for learning among very young children because it motivates them to keep going to 'undo' or 'retry' their attempts at getting it right (Flewitt et al., 2015).

Another beneficial feature of the app is that it allows children to add events from their lives to create their own story sequences. Drawing on children's own experiences in this way builds their sense of self, thereby supporting Saudi National Curriculum Framework (2018): young children possess e a strong sense of identity.

At the same time, this feature facilitates various forms of scaffolding on the part of the teacher (Neumann, 2014). For instance, cognitive scaffolding can be provided by questioning the child and supplying prompts or other forms of support to encourage them to think of a story sequence. Affective scaffolding can take place through provision of positive feedback to motivate the child to come up with new ideas. Technical scaffolding is provided when the adult helps the child to record her voice to add to the story sequences. Scaffolding has been identified as an important design consideration that can increase engagement with the app and the learning that goes with it.

Although more than one child can use the app at the same time, it does not encourage interaction because each has a pre-programmed game set by the teacher. However, the teacher can prompt discussion by asking children to talk about aspects of their lives that are related to the story; this also helps them to use some newly-learned words (Dickinson, 2001; Flewitt et al., 2015; Massey, 2013; National Early Literacy Panel, 2008). The teacher can also hold the iPad and control the app so the children can play and talk together instead of individually (Academics' Choice, 2020).

In summary, Go Sequencing helps children organise the sequence of events from beginning, middle and end to make sense of a story. Sequencing is an important skill in literacy and language development. As such, it has potential to enhance children's logical and critical thinking skills. Along the way, they also enhance their vocabulary skills, contributing to their language development.

**Figure 3.25. Go Sequencing app**


**Figure 3.26. Levels in the app.**

**Figure 3.27. What is the correct sequence?**


**Figure 3.28. This is the correct sequence.**


**Figure 3.29. Event texts are sequenced.**


## *Suitability of Starfall to Support ESL Learning in the ECE Setting in International Kindergarten:*

This article has shown that, when selecting apps for young children, educators need to consider the learning and development needs of children who are learning English as second language (ESL) of this age group. Educators also need to consider the learning needs of the individual child, especially young children who learn English as a second language . Another factor for educators to consider is whether an app mainly provides entertainment or has an educational purpose. Further, the app choice depends on the intended educational goal.

For example, the aim may be to enhance English language skills, introduce basic concepts like numbers, shapes and letters in English, teach social skills or expand vocabulary. When an app is used for an intended educational purpose, such as supporting a young child's ESL learning, a playful learning approach is essential for effective learning. Apps that foster playful and creative exploration promote learning in young children (Aldossary, Curwood & Niland, 2021; McManis & Gunnewig, 2012). The features of the Starfall app address all these considerations.

A young child learns and develops through social interaction with peers and is therefore likely to be interested in apps that encourage peer engagement and relationships (Aldossary, Curwood & Niland, 2021; Arnott, 2016; Einarsdóttir, 2011; Hatzigianni, 2014). To support a child's holistic development, an app should also be able to engage the child in interaction, not only with the app but with other children, family members and educators (Aldossary, Curwood & Niland, 2021). For example, a child could stop and ask their peers what they think or guess answers to questions in the activity. The activities provided on the Starfall app can facilitate social interaction that supports language development.

Educators need to be able to critically evaluate the apps they choose to help a child develop specific skills or topic knowledge (Danby et al., 2018; McMani & Gunnewig, 2012). Every app has strengths and weaknesses. EC educators can choose an app suited to their lessons and teaching strategies, enhancing the child's English language and vocabulary learning skills. Especially with inclusive classes with ESL children, educators should be able to identify and access educational apps that enhance these children's learning of the English language, thereby supporting their communications and interactions with their peers in English.

## *Conclusion:*

Truly speaking, it is rare to find an English learning app that meets all the fundamental characteristics identified in the study. It has included all those elements that are highly relevant for identifying and selecting effective ESL educational apps. However, the current work has made some progress in the right direction. Identifying a comprehensive educational app is a monumental task because educational app developers prefer to include their features in academic apps, such as Starfall. Still, the study has conducted empirical research and attempted to identify and evaluate an ESL app that offers all solutions to the problems faced by pre-schoolers.

In this perspective, the study has achieved two primary milestones that are highly relevant to understanding the significance of the research findings. The work has generated a checklist that future researchers can use to evaluate the efficacy of second-language learning educational apps. The primary components of this checklist are the following dimensions: language development, user-friendly, engagement, and interaction. For teachers, this checklist is like an opportunity to evaluate whether an app offers features that are fundamental for securing learning objectives.

For app developers, this mechanism is considerably impactful as it provides a guideline for making a comprehensive and effective educational app for young ESL learners. Subsequently, this study sheds light on the current status of English language pedagogy and related learning apps. Finally, the study findings recommend that all stakeholders must coordinate and work collectively. They include app developers, teachers, and independent researchers who perform their role effectively for developing ESL language learning apps for child learners. The role of each stakeholder is highly essential as young ESL learners need active and full support from all stakeholders. At home, parents need to provide more time and academic support to young ELS learners. At kindergarten, teachers ensure that all learners complete tasks and activities, including educational app time.

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