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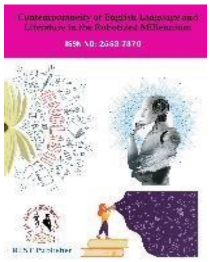

An SPSS Analysis of The Effects of a Smartphone Game That Incorporates Learning

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Abstract: *A mobile game for smartphones with an educational purpose attempts to amuse players while simultaneously delivering educational information and encouraging the development of skills and expertise. In order to create an exciting and stimulating learning experience, these games work to combine fun and engagement with instructional components. Players can engage in game play elements and challenges inside these games that are intended to promote creativity, problem-solving, and learning. The educational material covers a wide range of academic topics, including maths, science, language study, history, geography, & critical thinking. Mobile learning games' ability to enhance education by actively involving students, promoting knowledge acquisition, and enhancing motivation is the main research emphasis. Research can look at how these games affect learning outcomes, what motivates involvement, how they can be customised, how they can transfer skills, how they can be assessed, and how they affect educational inequalities. Understanding these factors can help educators design evidence-based solutions and successfully integrate game-based learning techniques into classroom settings. For statistical analysis purposes, the software programme known as SPSS, or Statistical Package für Social Sciences, is widely used in a variety of fields, including business, research on markets, healthcare, and the social sciences. The IBM-developed statistical analysis tool SPSS provides a wide range of tools and approaches for managing, preparing, and analysing data. Using the extensive tools and capabilities offered by SPSS, researchers and analysts can successfully carry out tasks like data purification, manipulation of data, and data transformation.*
Keywords: *Smartphone game, SPSS, apps, ANOVA*

1. INTRODUCTION

The growing use of cell phones has made it easier to gather, process, and analyse data as well as to collaborate and communicate with other students in real-time. This led to the development of the mobile learning environment. Mobile technologies offer the potential to support high-quality learning and encourage an educational approach that is more innovative and learner-centered. Successful trials using mobile devices to promote knowledge generation and transfer in a variety of areas, including science, society, and language courses, have been highlighted in numerous publications. Mobile technology can be useful cognitive tools, encouraging original problem-solving and involving students in real-world experiences. A method to influence student behaviour in a learning environment is educational gamification, which entails adding game-like aspects, player experiences, & cultural roles [1]. Since the early 2000s, educational technology has significantly contributed to students' academic growth, particularly in the area of scientific teaching in American high schools. In order to guarantee that American learners have access to chances that motivate them to pursue professions in the STEM disciplines, the government of the United States has made it a priority to provide enough resources and programmes. To adjust to the digital era, high schools are investigating creative ways to incorporate technology into the classroom. The term "digital era" refers to a time when a generation of people referred to as "digital natives" were exposed to technology at a young age. Student engagement can be increased by using tools like "Kahoot!" in addition to conventional teacher-centered lectures because it gives them the chance to participate more actively [2]. Gamification introduces cutting-edge engagement approaches, focusing on diverse communities and inspiring them to accomplish previously unimaginable objectives. To aid learning and achieve the desired results, it includes components like context, game story, human connection, immersion, and rules/goals. While there is interactive educational software created expressly for children who are blind, students are expected to have knowledge of and an interest in computer technology. Children who are blind can learn music using the teaching technology Musibraily, which was created by Borges and Dom. The incorporation of educational activities into Musibraily now enables the use of numerous exciting educational experiments and methodologies. Our goal is to integrate educational objectives with accessible features. Mascetti et al. developed TypeInBraille, a touchscreen-based Braille-based typing programme that needs at least three fingers to operate [3]. The COVID-19 pandemic's effects have been felt worldwide, disrupting the economy, the job market, and the educational system, among other areas of daily life. The virus's global spread has forced educational institutions to close their doors. As a result, it is imperative to use technology to guarantee improved accessibility to the process of learning. This can be done by creating instructional software, a web-based channels, or mobile apps that can be used on desktop computers, mobile devices, or tablets to facilitate learning. These technological advancements get over the constraints of time, place, and geography, enabling flexible and practical learning situations. Nowadays, more people use mobile devices than personal computers since they are more accessible and offer similar functionality [4]. Internet users are increasingly seeking for health-related information. For healthcare scientists and physicians, the adoption of new technologies for providing clinical instruction through online platforms & smartphone applications remains in its infancy. Both commercial sector and academic researchers are interested in gamification, a common strategy for encouraging positive behaviour change. Games are appealing to people of all ages, which has prompted some health experts to suggest taking use of gamification's potential to promote good changes in health behaviour. Points, stages, leaderboards, and other gaming characteristics are included in the generally used definition of gamification, which is "enhancing services using game-like elements that stimulate participation in games and drive behavioural results" (Hamari et al., 2014) [5]. Significant changes have been brought about by technological improvements in many different disciplines, particularly in education, wherein new trends are developing. The learning models that kids accept in schools are one of this development's major effects. The adoption of cutting-edge trends and practises in education is hampered by conventional teacher-centered approaches. Because of its accessibility and the abundance of learning resources, technology has become a key factor in the transformation of teaching and learning practises in the educational sector. Additionally, as the electronic world changes, new skills like information literacy, media literacy, & technology literacy are becoming more and more necessary. Students must accept and acclimatise to new technological developments in order to meet these needs [6]. Teenagers are more likely than ever to play video games, but little is known about the causes of excessive weekly gaming time or the potential regulating or protective factors. The regulation of adolescent gaming behaviour is found to be significantly influenced by parental control. Controlled mediation & conversational mediation are two different categories of the regulation of teenage media use. It's interesting to note that both types of mediation were shown to occur less frequently on private devices (like laptops) compared to communal ones (like televisions). This shows that when teenagers had personal computers, parents were more inclined to use controlling mediation. According to research, parents who adopt a disciplinarian approach can help their kids feel more comfortable using the Internet [7]. It is possible to improve the calibre of teaching and learning through the use of effective pedagogical strategies that integrate technology into the process of learning. Students' enthusiasm and enthusiasm for learning can be tapped into by educators by combining game-based learning with different technology. The learning process can be enhanced by incorporating components from well-known games, such as smartphone games and virtual reality games, into the educational setting. Aligning instructional practises with the instruments and assets that students frequently use in their daily lives is essential for fostering educational transformation. These tools and resources can dramatically increase student interest and enthusiasm in the learning process when they are properly integrated into the classroom. The usage of digital games in the classroom provides fresh opportunities for learning because these engaging and facilitate the attainment of learning outcomes [8]. As a scientific field, physics mainly relies on experimentation to arrive at results. However, specialised equipment is not always present in educational institutions, and even when it is, teachers may not always be properly educated to use it. As a result, physics instruction and learning require constant innovation through the use of new technology. Smartphones in particular have sensors that make are powerful instruments for precise measurement of physical processes. Another growing trend is cooperative learning, which encourages critical thinking and self-reliance in a group setting. It is crucial to use smartphones for educational purposes given their pervasiveness in the lives of pupils and their integration into the classroom. Making the most of technology in a constantly changing environment is essential. Utilising students' interest in and experience with mobile devices can therefore be a powerful tool for enhancing learning and improving the availability of educational content [9]. A complicated neurological illness called autism spectrum disorder (ASD) causes difficulties with social interaction, interaction, and repetitive behaviours. Finding effective treatments can be difficult because anxiety and sadness are frequently cooccurring diseases in children with ASD. Although there are currently therapeutic uses for extreme sports, little attention has been paid to particularly managing stress and anxiety in children with ASD. ASD is defined by the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) as including challenges with communication, social interaction, and repetitive behaviours. From mild signs without intellectual impairment to severe complaints with both cognitive disability and poor verbal communication, the degree and scope of the symptoms can vary substantially. Every kid or adult with ASD exhibits a distinctive profile, and the disorder has several facets [10]. Gamification is a revolutionary idea that entails integrating components from online games into situations that are not game-related (Simes, Dáz, & Fernández, 2013). According to various studies, it has been proposed as a strategy to encourage people to adopt sustainable behaviours, both privately and publicly. Examples of these behaviours include participating in physical activity, practising sustainable consumption, and fostering education. In the lives of kids and teenagers, playing video games is a significant leisure activity. For digital game-based learning initiatives to be successful, interesting and effective content design is essential. Children can develop imaginary worlds and improve their comprehension of their surroundings by playing games. Coyne (2003) asserts that involvement in sporting activities aids kids in forming moral principles and learning about the outside world. Gamification is the use of game mechanics and design to engage people and solve problems in contexts other than games [11]. Digital resources have made it possible for students to access a multitude of audiovisual content, which has caused them to pay less attention to traditional lectures. Since learning motivation & outcomes are closely related, many people believe that video games will play an increasingly important role in education in the future. The growth of critical thinking abilities like solving problems, thinking strategically, handling resources, planning, execution, and flexibility in work-related situations is facilitated by digital games. Consequently, it is worthwhile to research the development of successful digital learning games. A increasing corpus of research shows that educational games are effective at achieving educational goals. However, certain instructional games fail to effectively encourage learning motivation because their educational content and gaming scenarios are incompatible. Even with considerable global investments on game-based learning (GBL) studies, there is still much to learn about how to create games that effectively improve learning outcomes [12]. In order to improve students' knowledge and skill development, experiential education entails teachers purposefully engage students in active-learning activities and reflection moments. Dewey (1938), who emphasised the value of experience for the educational process, was the first to put forth the idea of experiential education. Kolb (1984), using Dewey's premises as a foundation, expanded on this thesis. The major goal of experiential education is to actively involve students in the material being learned, enabling them to gain knowledge that is useful and enhance information retention. The particular gaming technique used will determine how successful a particular approach is at integrating gaming into instruction. By encouraging cognitive & affective learning, improving retention, and encouraging collaborative learning, gaming as a teaching approach can successfully reinforce knowledge [13]. Video games as teaching tools are gradually becoming more popular in educational settings. It is becoming more widely recognised that video games embody learning principles such as immediate feedback, enabling the application of abstract ideas to concrete situations, enabling individualised progress, permitting failure without repercussions, and encouraging freedom for discovery and exploration. Numerous empirical researches have shown how beneficial video games are as teaching aids. Games have been incorporated into elementary, secondary, & higher education settings using a variety of strategies. Multiplayer games, which are often found in virtual locations referred to as multiuser online environments (MUVEs), are one common strategy [14]. By bridging the divide between actual experiences and prior knowledge, augmented reality (AR) is now recognised as a viable technique for improving student learning. Creating efficient techniques to direct students' focus on pertinent field observations is one of the primary problems of AR-based learning. Over the past ten years, educators have placed a greater emphasis on the value of immersing children in real-world educational environments for ecological observations. It is seen as a promising strategy for promoting student learning that the quick development of mobile & wireless network technology has made it possible to offer personalised learning support to specific pupils in this area. Field trips are recognised as providing kids with worthwhile experiences [15]. Recognising the importance of digital games in children's and adolescents' lives is essential for understanding how the environment affects people's developmental routes in the field of developmental psychology. According to a 2009 Kaiser Family Foundation poll, children between the ages of 8 and 18 spend on average 90 minutes a day playing video games. Other industrialised nations including the United Kingdom & Germany have seen similar trends in children and adolescent game playing. The quantity of time spent playing digital games is increasing as mobile phones and other portable devices become more common gaming platforms. According to recent research, most American teenagers (58%) own cell phones & spend, on average, about 15 hours each week using them [16]. People with chronic diseases must use techniques like goal-setting, self-monitoring, and social support in order to properly manage their health on a daily basis. Various tools, such as sensors worn on the wrist, serious games, & mobile digital counselling systems linked to patient online portals, have been developed to help patients and their carers achieve self-management goals. In this setting, we provide an extensive system that combines these techniques and helps young patients manage their diabetes through entertaining teaching games, monitoring tools, and encouraging comments. The platform's design integrates elements of radical game design, persuasive design of systems, and healthcare. A virtual trainer acts as a gaming guide and provides the user with personalised feedback on their daily upkeep tasks, which might help them, advance in the game's universe. The viability of using mobile technology together with web-based components was established in evaluations carried out with paediatric patients under the supervision of healthcare professionals. It was highlighted, nonetheless, that some presumptions regarding how users interacted with the website were not entirely realised, resulting in less than ideal user experiences [17]. Mobile educational gaming has drawn a lot of attention in research because it may make learning fun and raise student motivation, which increases involvement in the learning process. This strategy has the ability to enhance the learning process all around and encourage engaged student participation. The field of information and communication technology, or ICT, has made significant strides over time, and these developments have had a significant impact on many facets of human existence, including the economy, society, medical, and education. Technology improvements are being more widely adopted by educational institutions, such as colleges, universities, & lifelong learning facilities, in order to improve learning outcomes and facilitate the learning process [18]. Somatosensory interactive learning includes tying body movements to instructional content using gesture-based interfaces such Microsoft Kinect and Nintendo Wii. Microsoft Kinect & Nintendo Wii, which provides sensations of touch which can be enjoyed indoors, has completely changed how learners interact with video games. By offering a fun gaming experience, these items have the ability to increase students' motivation to learn or exercise. An efficient strategy for creating greater motivation and better learning results in students is game-based learning, which mixes games and leisure activities into the process of learning. The simplicity of learning through video games has been recognised by academics like Prensky (2001) & Garris, Ahlers, & Driskell (2002). Playing video games helps students absorb concepts more thoroughly, develops their ability to solve problems, and promotes active learning. Playing educational video games can also increase concentration, self-assurance, and learning outcomes [19]. The mobile gaming market is expanding quickly and is highly competitive. Daily game releases have increased significantly during the past two years. Universities and manufacturers have committed significant resources to developing mobile apps (APPs) that tackle numerous facets of daily life as a result of the popularity of smartphones & tablets. One of these is mobile gaming, which has grown to be a very competitive business and is garnering the interest of rivals in adjacent industries. Mobile games were downloaded more frequently than both paid as well as free alternatives in Taiwan, according to a 2012 survey by the 104 Research Centre. Consumer loyalty is seen as a key component of success and plays a crucial role in supporting the expansion of the mobile video game sector [20].

2. METHODOLOGY

Statistical Package over Social Sciences, or SPSS, is a widely used piece of software for performing statistical analysis in a variety of industries, including business, research on markets, healthcare, and social sciences. Designed by IBM, SPSS provides a wide variety of tools and methods for data preparation, management, and statistical analysis. It makes it possible for investigators and statisticians to complete activities like data cleaning, manipulating others, and transformation quickly. The software has an intuitive user interface that makes it easy to import data from many sources, explore data using graphical statistics & visual representations, and employ a wide range of statistical tests & models for data analysis. A wide variety of statistical techniques are covered by SPSS, such as t-tests, ANOVA, regression, factorization, cluster analysis, and others. SPSS provides comprehensive statistical procedures including t-tests, ANOVA (analysis of variance), regression analysis, factor analysis, cluster analysis and more. It also supports advanced techniques such as survival analysis, structural equation modelling and time series analysis. Users can customize analyzes and create reports and visualizations to effectively present their findings. In short, SPSS is a powerful statistical software package that helps researchers and analysts perform data analysis tasks effectively, allowing them to gain meaningful insights and make informed decisions based on their data.

2.1. Size of screen to read while walking: Depending on personal tastes and comfort levels, different screens can be the ideal size when reading while walking. But there are some important things to think about. When walking and studying, safety should always come first, and it's crucial to stay mindful of your surroundings. Choose a monitor size that allows for clean eyesight and peripheral awareness as a result. A huge screen may impair your field of vision and increase your risk of collision or an accident.

2.2. Weight while carrying in hand: The amount of weight that one can comfortably hold in their hands varies according to their strength, stamina, and preferences. When carrying hand weights, there are a few fundamental rules to keep in mind. It's crucial to avoid putting unnecessary tension on the joints and muscles when holding something in the hand. Long-term excessive weight carrying can cause tiredness, discomfort, and even injury. Therefore, it is advised to select a weight which you can sustain without placing too much strain on your body or jeopardising your balance.

2.3. Size of device to hold in hand: Depending on individual tastes and hand size, the size of the gadget that is pleasant to have in the hand varies. There are a few general things to think about, though. When choosing the size of a device that can be carried around, factors including ergonomics, usability, & portability are taken into consideration. The tool should be made so that it may be used comfortably and easily without putting any pressure on the user's hands.

2.4. Display of maps: Visual maps are graphic representations of geographic data, whether they are presented digitally or physically. They serve the objective of illuminating the spatial relationships, characteristics, and positions of various places on the surface of the Earth. In the digital world, people frequently use computers, smartphones, or specialised GPS devices to examine maps. These gadgets use screens and displays to give users a visually understandable interpretation of map data. The degree of clarity & level of information that can be efficiently displayed is significantly influenced by the resolution and size of the screen.

2.5. Input of text with pen: Text input with a pen refers to the act of entering or writing text on a digital device with a pen or stylus, frequently a device with a touch screen or a specialised tablet with handwriting recognition capabilities. Users can immediately sketch or write characters onto the screen using this technique, and the computer will capture and translate them into text. This method simulates the feeling of writing using a writing instrument on paper and offers a more natural and natural way to enter text.

3. RESULT AND CONCLUSION

TABLE 1. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.840	.840	5

The reliability statistics presented in Table 1 provide information about the internal consistency or reliability of a scale or questionnaire. Specifically, they indicate the extent to which the items in the scale consistently measure the same underlying construct. In Table 1, there are three reliability statistics reported: Cronbach's Alpha, Cronbach's Alpha Based on Standardized Items, and the number of items in the scale. Cronbach's Alpha: Cronbach's Alpha is a commonly used measure of internal consistency reliability. It ranges from 0 to 1, with higher values indicating greater internal consistency. In this case, Cronbach's Alpha is reported as .840, indicating a high level of internal consistency among the items. Cronbach's Alpha Based on Standardized Items: This statistic is similar to Cronbach's Alpha but is computed based on the standardized scores of the items. The reported value of .840 suggests that even when considering the standardized scores, the scale maintains a high level of internal consistency.N of Items: This indicates the number of items included in the scale. In this case, there are 5 items. Overall, the high Cronbach's Alpha values (.840) suggest that the scale has a good level of internal consistency, indicating that the items are reliable measures of the underlying construct being assessed.

TABLE 2. Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Size of screen to read while walking	279	4	1	5	3.53	1.150	1.322
Weight while carrying in hand	273	4	1	5	3.53	1.102	1.213
Size of device to hold in hand	274	4	1	5	3.72	1.153	1.329
Display of maps	278	4	1	5	3.70	1.076	1.157
Input of text with pen	278	5	1	6	3.66	1.196	1.430

Table 2 provides descriptive statistics for five variables related to the characteristics of screens, weight, size, display, and input methods. Let's go through each column of the table: N: This column represents the number of observations or respondents for each variable. For example, the variable "Size of screen to read while walking" has 279 observations or respondents. Range: This column shows the range of values observed for each variable. It is calculated as the difference between the maximum and minimum values. For instance, the range for "Size

of screen to read while walking" is 4 Minimum: This column indicates the lowest value recorded for each variable. In the case of "Size of screen to read while walking," the minimum value is 1.
Maximum: This column displays the highest value recorded for each variable. For example, the maximum value for "Size of screen to read while walking" is 5. Mean: The mean represents the average value of the variable across all observations. It is calculated by summing all the values and dividing by the number of observations. For example, the mean value for "Size of screen to read while walking" is 3.53. Std. Deviation: The standard deviation measures the dispersion or variability of the values around the mean. It provides an indication of how spread out the data points are from the average. A higher standard deviation implies greater variability. In the case of "Size of screen to read while walking," the standard deviation is 1.150. Variance: The variance is another measure of variability. It is the square of the standard deviation and provides a measure of the average squared deviation from the mean. A higher variance indicates greater dispersion. The variance for "Size of screen to read while walking" is 1.322. Skewness: Skewness measures the asymmetry of the distribution of values. Negative skewness indicates a longer or fatter tail on the left side of the distribution. In this case, the skewness for "Size of screen to read while walking" is -.506. Kurtosis: Kurtosis measures the shape of the distribution and indicates whether it has heavy tails or is more peaked compared to a normal distribution. Negative kurtosis indicates a distribution that is less peaked than a normal distribution. The kurtosis for "Size of screen to read while walking" is -.565. These descriptive statistics provide information about the central tendency, variability, and shape of the distributions for each variable in the dataset.

TABLE 3. Correlation Matrix

	Size of screen to read while walking	**Weight while carrying in hand**	**Size of device to hold in hand**	**Display of maps**	**Input of text with pen**
Size of screen to read while walking	1.000	.477	.576	.430	.452
Weight while carrying in hand	.477	1.000	.543	.556	.466
Size of device to hold in hand	.576	.543	1.000	.571	.574
Display of maps	.430	.556	.571	1.000	.483
Input of text with pen	.452	.466	.574	.483	1.000

Table 3 presents a correlation matrix, which shows the pairwise correlations between five variables: "Size of screen to read while walking," "Weight while carrying in hand," "Size of device to hold in hand," "Display of maps," and "Input of text with pen." The correlations range from -1 to 1, indicating the strength and direction of the relationships between the variables. Here is an interpretation of the correlation matrix:The correlation between "Size of screen to read while walking" and itself is always 1, as it represents the correlation of a variable with itself. The correlation between "Size of screen to read while walking" and "Weight while carrying in hand" is .477. This indicates a moderate positive correlation between these two variables. The correlation between "Size of screen to read while walking" and "Size of device to hold in hand" is .576, indicating a moderate positive correlation. The correlation between "Size of screen to read while walking" and "Display of maps" is .430, suggesting a moderate positive correlation. The correlation between "Size of screen to read while walking" and "Input of text with pen" is .452, indicating a moderate positive correlation. The correlation between "Weight while carrying in hand" and "Size of device to hold in hand" is .543, representing a moderate positive correlation. The correlation between "Weight while carrying in hand" and "Display of maps" is .556, indicating a moderate positive correlation. The correlation between "Weight while carrying in hand" and "Input of text with pen" is .466, suggesting a moderate positive correlation. The correlation between "Size of device to hold in hand" and "Display of maps" is .571, indicating a moderate positive correlation. The correlation between "Size of device to hold in hand" and "Input of text with pen" is .574, indicating a moderate positive correlation. The correlation between "Display of maps" and "Input of text with pen" is .483, suggesting a moderate positive correlation. The correlation matrix provides insights into the relationships between the variables, indicating the strength and direction of their associations. The positive correlations suggest that as one variable increases, the other tends to increase as well, while the moderate strength indicates a moderate degree of association between the variables.

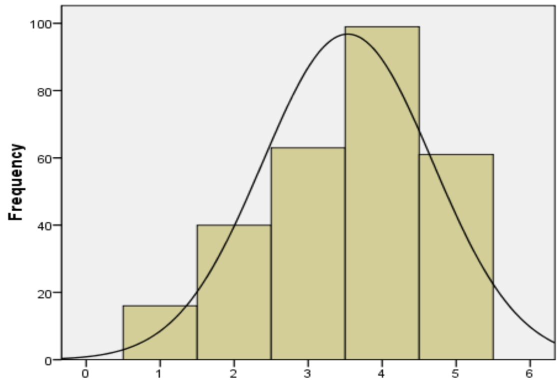

FIGURE 1. Frequency for Size of screen to read while walking

Figure 1 The histogram plot for frequency for Size of screen to read while walking With the exception of the 4 value, all other values are beneath the normal curve, demonstrating that the model is considerably following the normal distribution. As can be observed from the image, the data are slightly Wright skewed because more respondents chose option 4 for vocabulary frequency.

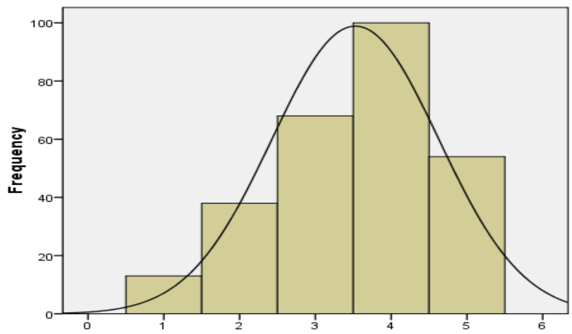

FIGURE 2. Frequency for Weight while carrying in hand

Figure 2 The histogram plot for frequency for Weight while carrying in hand With the exception of the 4 value, all other values are beneath the normal curve, demonstrating that the model is considerably following the normal distribution. As can be observed from the image, the data are slightly Wright skewed because more respondents chose option 4 for vocabulary frequency.

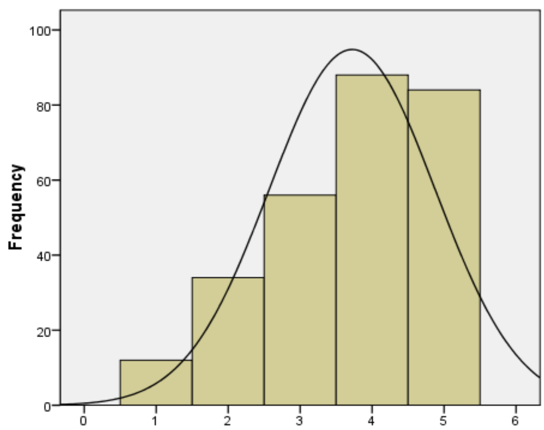

FIGURE 3. Frequency for Size of device to hold in hand

Figure 3 The histogram plot for frequency for Size of device to hold in hand With the exception of the 5, 4 value, all other values are beneath the normal curve, demonstrating that the model is considerably following the normal distribution. As can be observed from the image, the data are slightly Wright skewed because more respondents chose option 5, 4 for vocabulary frequency.

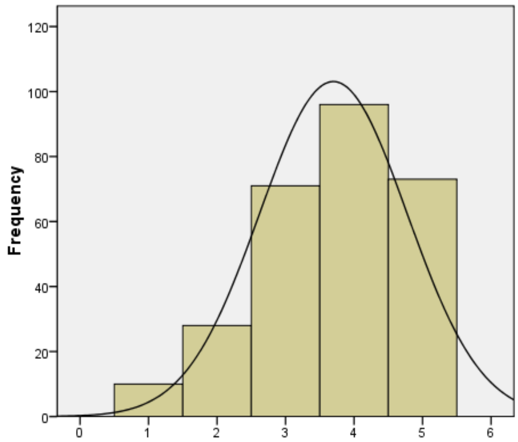

FIGURE 4. Frequency for Display of maps

Figure 4 The histogram plots for frequency for Display of maps with the exception of the 4 value, all other values are beneath the normal curve, demonstrating that the model is considerably following the normal distribution. As can be observed from the image, the data are slightly Wright skewed because more respondents chose option 4 for vocabulary frequency.

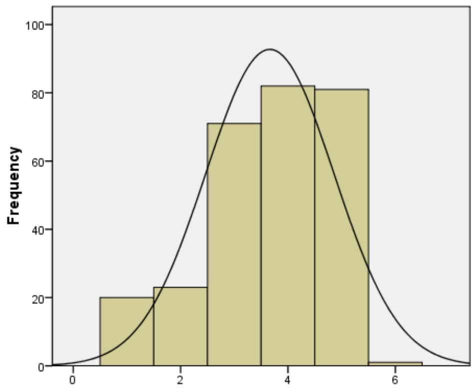

FIGURE 5. Frequency for Input of text with pen

Figure 5 The histogram plot for frequency for Input of text with pen With the exception of the 5, 4 value, all other values are beneath the normal curve, demonstrating that the model is considerably following the normal distribution. As can be observed from the image, the data are slightly Wright skewed because more respondents chose option 5, 4 for vocabulary frequency.

4. CONCLUSION

Mobile devices have become more and more popular, which can facilitate data collection, process and analysis, and the high interactivity enabled by beaming makes collaboration and communication among students handy. A learning environment is so-called mobile learning. Mobile technologies can meet higher order learning needs and realizing a more creative and learner-centered educational process. Several studies have demonstrated successful experiments that support knowledge production and transmission among learners and educators through the use of mobile devices in the learning activities of various courses, such as natural science, social science and language courses. Mobile technologies can be used as powerful cognitive tools within constructivist approach to solve complex problems and to engage students in authentic and meaningful activities. Educational gamification proposes the use of game-like rule systems, player experiences and cultural roles to shape learners' behaviour. Since the start of the 21st century, educational technology has played a major role in students' academic progress, especially in the area of the sciences in the United States high school education system. The United States government made it a priority that American students have access to adequate resources and programs to motivate more high school students to enter the Science, Technology, Engineering, and Mathematics (STEM) fields as a career option. High schools are trying new ways of incorporating technology into the classrooms to support the new environment: The Digital Era. Bennett et al. describe the Digital Era as the time when "Digital Natives", a generation of individuals, have been exposed to technology since birth. The use of 'KAHOOT!' as a supplement to a traditional teacher-centered lecture setting increases engagement by allowing the students to demonstrate their knowledge in a fun and exciting way. SPSS (Statistical Package for the Social Sciences) is a software program widely used for statistical analysis in various fields such as social sciences, market research, healthcare, and business. Developed by IBM, SPSS provides a comprehensive set of tools and techniques for data management, data preparation, and statistical analysis. With SPSS, researchers and analysts can efficiently perform tasks such as data cleaning, data manipulation, and data transformation. It offers a user-friendly interface that allows users to import data from various sources, explore the data using descriptive statistics and graphical representations, and apply a wide range of statistical tests and models to analyze the data. SPSS provides an extensive set of statistical procedures, including t-tests, ANOVA (analysis of variance), regression analysis, factor analysis, cluster analysis, and more. It also supports advanced techniques such as survival analysis, structural equation modelling, and time series analysis. Users can customize analyses and generate reports and visualizations to present their findings effectively. In summary, SPSS is a powerful statistical software package that enables researchers and analysts to perform data analysis tasks efficiently, allowing them to derive meaningful insights and make informed decisions based on their data

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