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The impact of storytelling and narrative variables on skill acquisition in gamified learning

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Introduction

A B S T R A C T

This research attempts to better understand how students in Saudi Arabia benefit from narrative and story aspects in gamified learning environments. Data from a sample of 500 persons with varying levels of education are analyzed using quantitative methods such as descriptive statistics, correlation analysis, and multiple regression analysis. The findings point to strong positive correlations between the use of gamification in education, the influence of storytelling, narrative variables, and the acquisition of new skills. There has been a significant shift toward the use of narrative variables as measures of mastery in gamified classrooms. This study's results show that using gamified learning with story elements may increase students' interest, motivation, and knowledge retention. Efforts are now being made by Saudi Arabia to update its educational system and provide its youth with the tools they'll need to succeed in the country's emerging knowledge-based economy. The use of game-based learning and narrative-rich experiences has promising results in this setting.

1. Introduction

When educational technology and pedagogy are combined, a new era of learning is ushered in, one that is marked by novelty, active participation, and adaptability. For a long time, conventional approaches to education have played an important role in Saudi Arabia. There is a widespread recognition of the value of education in this nation. However, these approaches have been demonstrated to fall short of adequately equipping students with the vital 21st-century skills that are increasingly sought after in a dynamic global market (Alzahrani, 2017). Given this paradox, it is critical that effective educational methods be developed to address the current skills gap. It is imperative that these methods be put into action without delay.

Game mechanics are incorporated into the classroom to increase student engagement and knowledge retention (Deterding et al., 2011). Our research investigates how game-based learning might solve this learning problem by including storytelling and narrative elements. Vision 2030 (places a premium on building a knowledge-based society, hence the above educational paradigm change is particularly pertinent to the Saudi Arabian context. Considering Saudi Vision 2030's goal of transforming the kingdom into a knowledge-based society by 2030, this is the case. The first problem we want to fix is the first issue we want to fix: the inability of conventional methods of education in Saudi Arabia to adequately prepare students for the challenges of the contemporary job market. According to Alzahrani (2017), traditional techniques of teaching such as recitation

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and passive observation have been demonstrated to be less effective than formerly believed in equipping students with the skills necessary for success in the 21st century workplace.

To modernize and restructure its educational system, the Kingdom of Saudi Arabia has just begun a massive undertaking. One of the most important aspects of this change is the implementation of Saudi Arabia's Vision 2030, an all-encompassing strategy to encourage economic diversification and reduce reliance on income from oil (Saudi Vision 2030, 2016). The 2016 publication of Saudi Vision 2030. At its core, this vision is about creating a culture built on learning and education. For this reason, it is essential to have a workforce that is both well-educated and talented. The aims outlined in Vision 2030 are consistent with the use of game-based learning, hence its adoption should be promoted. By incorporating game elements like competition, prizes, and immersive storytelling into learning activities, Hamari and Koivisto (2014) define gamified learning as an approach to enhancing student motivation and engagement. Findings from this study (Deterding et al., 2011) suggest that elements of gaming are included into educational software with the intention of making learning more engaging and fun. This format is meant to get students more involved in the learning process and to get them more excited about putting in the time and effort required for the numerous tasks.

There is no way to overstate the importance of lifelong learning in today's world of constant innovation. Due to rapid technology development and heightened global interconnection, the traditional concept of a job has been completely rethought, and employees must now acquire a wide range of transferable skills (World Economic Forum, 2016). These competencies, which are sometimes grouped together under the umbrella term "21st-century skills," include the capacities for analysis, problem solving, innovation, expression, and teamwork. Investing time and energy into honing one's "soft skills" is of the utmost importance, as it not only contributes to one's own happiness and fulfilment in life but also to the growth and progress of society. This trend has caused educators to place a greater emphasis on helping students acquire transferable skills that can be used in a variety of contexts (Trilling & Fadel, 2009) as opposed to just teaching them in a classroom. The previous method prioritized reading and writing, so this shift is quite encouraging.

Traditional approaches to education are insufficient at capturing students' interest and encouraging the growth of their abilities. The term "gamified learning" has been bandied around a lot lately, and it has piqued the curiosity of academics in looking for new ways to teach. Students in gamified classrooms make decisions, solve problems, and work together on projects inside a narrative framework that includes elements of games, as stated by Anderson and Dron (2011). The word “gamification” describes the use of game mechanics inside a formal learning environment. Storytelling and narrative elements added to gamified settings have been demonstrated to improve students' learning outcomes, according to research by Lieberoth et al. (2017). This is because these methods help students better connect with and retain the material. More study is needed to fully realize the potential of narrative-driven approaches, especially in the one-of-a-kind Saudi Arabian cultural and educational setting.

1.1 Objective of the Study

The main intention of this study is to investigate how students in Saudi Arabia might improve their skills by using gamified learning settings that include story and narrative elements.

2. Literature Review and Previous Studies

Incorporating gaming elements like points, awards, competition, and challenges into traditional learning environments is known as “gamified learning” (Deterding et al., 2011). Fundamentally, this idea rests on using games' intrinsic incentives to create engaging learning experiences. Since it has been shown to increase students' enthusiasm and participation in class (Anderson & Dron, 2011), the tactic has gained widespread popularity in a variety of settings and fields of study. Evidence from a variety of studies demonstrates that employing gamified learning strategies may improve student engagement and retention. Incorporating gamified elements like badges and leaderboards was shown to have a positive effect on student engagement and motivation, as reported by study by Hamari and Koivisto (2014). Studies by Seaborn and Fels (2015) give empirical support for the idea that gamifying the learning process might boost performance and aid in long-term memory retention. These findings highlight the need to integrate gamified learning into current pedagogical methods.

The dissemination of information and the accumulation of new knowledge have both benefited greatly from the storytelling tradition and have occurred at different times and in different places. Storytelling has the potential to become a highly useful tool in the field of education, particularly when it comes to the dissemination of ideas, the elicitation of reactions from students, and the improvement of the latter's capacity to recall what they have learned. Learning environments are improved to be more individualized and relevant when material is presented to students in the form of a story, and students retain more of what they are taught as a result. Students that used this method to study were more likely to retain the information they were taught, as reported by Lieberoth et al. (2017).

The benefits of using storytelling in the classroom have been the subject of several scholarly investigations. To determine whether or not narratives are useful in distance learning, Prada et al. (2022) performed a study. The results of the research showed that enrollment and retention were significantly increased. The effectiveness of narrative-centered interventions in STEM education was also assessed by Fenesi et al. (2017). This study suggests that using stories in the classroom may increase both students' motivation to learn and their ability to retain information. Many factors, such as the evolution of the plot and the characters and the story's internal coherence, contribute to the tale's narrative. The aforementioned factors may be utilized

to determine whether or not a story will have a constructive effect on students' academic performance. Empathy for the story's protagonists and antagonists, as reported by Kara et al. (2019), may help students retain more of what they read. Some characteristics of stories have been shown to increase their likelihood of success in academic studies. Research by Johnson and Mayer (2012) suggests that using a storyline to organize multimedia learning tools might improve their effectiveness. Students' understanding and retention of the lesson's subject greatly benefited by the narrative format in which it was given. In addition, Höffler and Leutner (2007) performed a research study that looked at how story structure affected students' comprehension of animated lessons. According to their findings, researchers found that adding story elements improved knowledge retention. There is a lot of room for growth in education if narrative and storytelling are included in gamified learning environments. Deterding et al. (2011) claim that when educators combine the incentive of gamification with the emotional depth of storytelling, they may provide learning experiences that are both immersive and engaging.

Despite this, there is a dearth of studies that explore how stories might be integrated into gamified learning, with the bulk of research focused on the more general impacts of gamification. Few studies have dug into the specific processes by which narrative components within gamified settings affect the process of skill development. It is crucial to assess the effectiveness of gamified learning approaches within the cultural environment of Saudi Arabia because of the unique cultural and contextual aspects present there. Because of the potential for gamified learning to take on different forms in different cultural contexts, it is helpful to conduct cross-cultural research to better understand the challenges and opportunities presented by this method. Research by Al-Maroof and Al-Emran (2018) on the impact of gamification on student motivation and performance in a Middle Eastern context stands out as an exemplary example of cross-cultural study in this area. Insights into the possible applicability of gamified learning in the larger Arab region are provided, even if the research does not concentrate only on Saudi Arabia.

The educational system in Saudi Arabia has its own unique set of challenges and opportunities. Vision 2030, as cited by Al-Jaifi (2018), puts an emphasis on education as a tool to create a knowledge-based society. The prevailing educational approaches implemented in the region, regrettably, pose a hindrance to the attainment of these objectives. Therefore, it is crucial to examine new approaches to education, such as the combination of gamified learning and storytelling, to overcome these challenges and release the latent potential of students in Saudi Arabia.

3. Methods

This quantitative study looked at Saudi Arabian students' experiences with gamified learning settings, namely the importance of narrative aspects and storytelling. The researchers employed a cross-sectional study design to get greater insight into the relationships between these factors. By taking a longitudinal view, we were able to analyze how gamification, storytelling, narrative aspects, and skill acquisition interact with one another to produce learning outcomes. This approach was used in the unique setting of Saudi Arabia, where it was able to collect data from 500 students enrolled in a wide variety of primary through graduate degree programs. To make sure that our sample population accurately reflects the population at large, including its many demographic subsets (such as educational attainment), we employed stratified random sampling.

A well crafted questionnaire designed to capture quantitative data was used in the data collection procedure. Questions in the survey were graded on a Likert scale so that researchers could get an accurate read on a variety of factors. In this study, we looked at how much time students spent on gamified learning activities, how much influence narrative variables had on skill assessments, and how differently we evaluated participants' skill gains depending on their individual educational backgrounds. Participants were given clear directions on how to complete the survey when they were given access to it electronically. To ensure a representative sample and build a thorough data collecting technique, we gathered information over the course of two weeks.

In order to analyze the data, we utilized SPSS (Statistical Package for the Social Sciences). Several types of statistical analysis, both descriptive and inferential, were used in the research. Descriptive statistics were used to the data, such as means and standard deviations, to better comprehend the most salient patterns and variations in the analyzed variables. Inferential statistics were utilized in the research to look for patterns, namely correlation analysis and multiple regression analysis. The strength and direction of associations between variables were assessed using Pearson's correlation coefficients. In addition, a multiple regression analysis was used to see whether there was any correlation between certain aspects of stories and the ability to pick up new skills. In order to identify meaningful correlations, a p-value cutoff of 0.05 was selected as the threshold for statistical significance.

4. Results

Table 1 demonstrates some basic statistics about the variables of the proposed study.

Table 1
Descriptive Statistics for Variables

Variable	Mean	Standard Deviation	Minimum	Maximum
Gamified Learning Engagement	4.23	0.78	2.10	5.00
Storytelling Impact	3.89	0.92	1.50	5.00
Narrative Variables	4.56	0.65	3.20	5.00
Skill Acquisition	4.01	0.84	2.30	5.00

The average student rating of 4.23 out of 5 suggests a high level of engagement with gamified learning activities. This indicates that the students were involved in the gamified learning process. The average rating for storytelling's impact in a gamified learning environment was 3.89 out of 5. The results of this study reveal that students, on average, see storytelling as a positive factor in their learning experiences inside gamified environments.

The average rating for narrative aspects among survey respondents was 4.56 on a scale from 1 to 5. This suggests that the integration of narrative components in gamified learning significantly improves the educational setting by making it more interesting and exciting for students. On a scale from 1 to 5, students gave gamified learning an average score of 4.01, indicating that they felt they had gained a significant quantity of skills appropriate to their level of study.

Table 2
Correlation Matrix

Variable	Gamified Learning Engagement	Storytelling Impact	Narrative Variables	Skill Acquisition
Gamified Learning Engagement	1.000	0.678*	0.756*	0.689*
Storytelling Impact	0.678*	1.000	0.712*	0.621*
Narrative Variables	0.756*	0.712*	1.000	0.775*
Skill Acquisition	0.689*	0.621*	0.775*	1.000

*Correlation is significant at the 0.05 level (two-tailed).

The relationships between the variables are shown by the correlational analysis presented in Table 2. There is a significant positive correlation (r = 0.678, p 0.05) between Gamified Learning Engagement and the Impact of Storytelling. This research suggests that students' reports of their engagement in gamified learning activities are correlated with their views of storytelling as a major component impacting their learning experiences in these activities. There is a significant positive correlation (r = 0.756, p 0.05) between Narrative Variables and Gamified Learning Engagement. What this research shows is that when students are engaged in gamified learning, they place a higher value on the narrative elements that are a part of these environments.

Engagement in gamified learning has been shown to correlate positively with skill acquisition (r = 0.689, p 0.05). This research suggests that students who engage in gamified learning activities are more likely to develop skills that are appropriate for their academic level. There is a favorable correlation between the effect of storytelling and narrative factors (r = 0.712, p 0.05). This shows that students who value narrative qualities in their learning environments also value storytelling as having a substantial impact on gamified learning environments.

There is a favorable correlation between the two concepts of Storytelling Impact and Skill Acquiring (r = 0.621, p 0.05). This research suggests that learners who credit narrative for their success in gamified classrooms also report bigger gains in competence. The positive correlation between narrative variables and skill acquisition is striking and statistically significant (r = 0.775, p 0.05). Students who place a higher value on narrative aspects in gamified learning environments are more likely to report substantive skill gains.

Table 3
Multiple Regression Analysis for Skill Acquisition

Predictor Variables	Beta (Standardized Coefficients)	t-value	p-value
Constant	1.23	4.56*	<0.001
Gamified Learning Engagement	0.365	2.31*	0.022
Storytelling Impact	0.251	1.89	0.067
Narrative Variables	0.412*	3.01*	0.005

*Significant at the 0.05 level (two-tailed).

Multiple regression analysis is used in Table 3 to look at the correlation between Gamified Learning Engagement, Storytelling Impact, and Narrative Variables and Skill Acquisition. The model's constant (also known as the intercept) is 1.23. This statement represents the expected Skill Acquisition score if all independent variables are set to zero. Gamified Learning Engagement is related to the result in a significant way, with a standardized coefficient (Beta) of 0.365. This result reveals that there is a positive association between Gamified Learning Engagement and Skill Acquisition, with a 0.365-standard-deviation increase in Skill Acquisition for every one-unit increase in Gamified Learning Engagement. There is a statistically significant correlation between the variables (t = 2.31, p = 0.022).

In correlation with the "Storytelling Impact" variable, the standard error of the coefficient is 0.251. There is a link between the power of narrative and the development of expertise, although it is not statistically significant at the 0.05 level of scrutiny (t = 1.89, p = 0.067). As a result of this finding, it seems that the role of Storytelling in the Acquiring of Skills may be very little in comparison to other elements in the model. For narrative variables, the standardized coefficient is 0.412, suggesting a significant correlation (t = 3.01, p = 0.005). As seen below, an increase of one unit in the Narrative Variables is correlated with a 0.412-standard-deviation increase in Skill Acquisition, suggesting a positive association between the two. It is obvious that this variable has the most substantial and statistically significant impact on Skill Acquisition out of the three predictors.

5. Discussion

5.1 Enhanced Engagement through Gamified Learning

Gamifying the educational process has the potential to significantly increase students' engagement. In line with prior research that has highlighted the motivational aspects of gamification (Hamari & Koivisto, 2014), this finding supports the practice. Since students who actively participate in gamified learning environments tend to absorb and effectively apply the skills being

taught, this correlation between the two is not surprising. This finding underlines the practical need of incorporating gamified components into educational practices in Saudi Arabia and elsewhere.

According to proponents of gamified education, people have a hardwired need to learn in ways that make them feel like they're making progress or doing something. Several elements of games are included in this method (Anderson & Dron, 2011): competitiveness, rewards, and challenges. The introduction of game-inspired aspects into educational settings allows teachers to tap into students' innate motivation, resulting in a more interactive and immersive classroom experience. Gamified learning presents a potentially effective strategy for promoting student motivation and engagement, which in turn leads to improved learning outcomes (Alzahrani & Goodwin, 2014) in the context of Saudi Arabia, where traditional educational approaches have faced challenges in effectively engaging students.

Further, the fact that there is a positive correlation between participation in gamified learning and skill acquisition indicates that this engagement goes beyond mere involvement to really improve one's skills. This finding accords with the theory that students who take an active role in their learning are more likely to put in the effort required to master new concepts and skills (Kuh, 2009). World Economic Forum (2016) notes that Saudi Arabia's educational reform plans place a premium on teaching students' skills they can use in the modern workplace, and this is where gamified learning comes in.

It is a frequent worry in traditional classrooms that students would lose interest or get disengaged over time, but incorporating gamified elements into educational methods may be an effective way to combat this. According to Deterding et al. (2011), gamification allows for a dynamic and ever-expanding learning experience since students are always encouraged to advance in the game or receive rewards. Gamification of education can excite and engage students, who are thus more likely to put forth effort and produce better long-term outcomes in their education.

Furthermore, the fact that gamified learning engagement is positively related to skill acquisition suggests that the engagement fostered by gamified learning goes farther than basic participation, resulting in real skill advancement. This finding is in keeping with the theory that students who are more engaged in their own education are more motivated to put in the effort required to become proficient in new concepts and skills (Kuh, 2009). When placed in the context of Saudi Arabia's educational reform efforts, which aim to equip students with 21st-century skills, gamified learning's potential to increase student engagement becomes more apparent (World Economic Forum, 2016).

The challenge of keeping students interested and motivated in traditional classroom settings may be overcome with the help of gamified elements included in educational methods. Learning via gamification, as stated by Deterding et al. (2011), is more exciting and engaging for students since they are constantly pushed to advance through the game and gain rewards. Game-based learning has the ability to increase and sustain students' interest in and effort in their coursework, which in turn might improve their learning outcomes.

5.2 The Role of Storytelling within Gamified Learning

Students' belief in the value of storytelling has been shown to correlate positively with the development of their skills. This finding suggests that there are situations in which the use of storytelling may significantly contribute to the improvement of skill development. This result is consistent with the findings of earlier studies that have highlighted the importance of narratives in efficiently conveying information and enhancing the learning process.

Teaching via narrative has been shown to be effective and transferable in a variety of cultural settings, as stated by Lieberoth et al. (2017). Al-Said (2017) argues that Saudi Arabian culture places a high value on cultural narratives and oral traditions. Therefore, it is consistent with cultural norms to use storytelling in classroom settings. Teachers that include storytelling into their lessons may find that their pupils become more in tune with and appreciative of their own cultural traditions, which in turn improves their capacity for learning. It is possible that instructors might offer a better learning environment if they included engaging tales that resonated with their students' cultural identities.

There is a strong correlation between narrative interest and skill development, which may explain the success of story-based training inside gamified learning settings. The aforementioned research by Fenesi et al. (2017) shows how narrating a tale may increase students' ability to remember and apply what they've learned. There is some evidence that storytelling may be an effective teaching tool for improving students' ability to understand and remember what they've learned. Providing students with the tools they need to succeed in the Saudi Arabia's knowledge-based economy is a top priority for the country's educational system, as indicated in Saudi Vision 2030 (2016). As a result, the role of narrative in the development of these competencies becomes more crucial.

One possible explanation for storytelling's success in gamified learning is that it creates a sense of forward momentum and narrative cohesion. Based on their findings, Kara et al. (2019) conclude that students learn best when they are guided through a succession of events, ideas, or challenges inside a well-designed narrative framework. This empirical research reveals how much of an impact narrative-based teaching has on students' ability to learn and remember new material. Mayer (2005) claims that research shows a strong correlation between using instructional design principles and students' performance in the classroom. The story structure here shows a deliberate commitment to these underlying principles. By including stories in lessons, gamified educators may encourage a more methodical and organized approach to skill development and increase students' engagement with the material.

Given the strong correlation between engaging storytelling and skill acquisition, it stands to reason that stories might be employed effectively in game-based learning contexts to speed up the process of mastering the necessary abilities. The

research by Fenesi et al. (2017) shows that using a narrative to teach a topic has several benefits, including improving students' capacity to remember what they've learned and utilize it in real-world situations. The use of narratives in the classroom has been proved to improve students' understanding of the material and their capacity to draw connections to their own lives and experiences. As a consequence, this method has been linked to better knowledge retention and recall. Due in large part to its emphasis on preparing students for the knowledge-driven economy, the Saudi Arabian educational system gives narrative a vital role in the classroom.

In the context of game-based learning, the question of whether or not narratives can provide a sense of forward momentum and cohesiveness has been discussed. Successful leadership in leading learners, as stated by Kara et al. (2019), requires the presenting of events, concepts, or issues in a logical and clear manner. Well-structured stories are crucial in accomplishing this goal. This structure makes it easier to take in new information. Using a narrative framework like this is consistent with the principles of good instructional design, since research has shown that the way material is presented considerably affects students' ability to understand and remember it (Johnson & Mayer, 2012). Narratives in gamified education have the potential to improve students' learning experiences and encourage a more methodical, all-around approach to skill development.

5.3 Narrative Variables as Key Predictors of Skill Acquisition

Character development, plot progression, and narrative consistency are all aspects that may be influenced by adjusting various narrative elements. Incorporating narrative elements into gamified learning helps to offer students with a compelling storyline that keeps them engaged and invested in the learning process from beginning to end. Based on their findings, Lieberoth et al. (2017) conclude that narrative variables have a strong positive correlation with skill development. This discovery demonstrates how much narrative variables contribute to shaping the educational process as a whole. Teachers may both motivate and guide students toward skill mastery via the use of well-structured narratives. The relevance of Narrative Variables in the context of gamified learning becomes especially essential within the setting of Saudi Arabia's educational reform, which aims to equip students with 21st-century practical skills (Saudi Vision 2030, 2016).

Narratives, as argued by Kara et al. (2019), provide a coherent and orderly framework for the organization of instructional information, hence facilitating students' understanding and retention of that material. Since narrative variables have been shown to correlate positively with skill acquisition, it stands to reason that providing narrative coherence and well-developed characters in instructional materials might help students learn more effectively. Johnson & Mayer's (2012) theory of multimedia learning, which stresses the need of coherence and organization in the production of instructional resources, agrees with this assertion. Critics in Saudi Arabia have said that conventional memorization techniques are useless in the real world. Incorporating story-based learning into gamified settings is one approach that might help bridge the gap between classroom theory and real-world application.

Furthermore, Narrative Variables facilitate the bridge between theoretical insight and applied practice. According to the study's findings, these elements have a positive effect on students' ability to apply what they learn in the classroom to real-world scenarios (Fenesi et al., 2017). Considering Saudi Arabia's ever-changing educational climate, which places a premium on preparing students for a knowledge-driven economy in accordance with Saudi Vision 2030 (2016), the importance of incorporating narrative-rich gamified learning to facilitate the cultivation of practical skills becomes more apparent. Educators' capacity to equip students with the information and abilities to succeed in today's complicated and potentially rewarding professional environment may be bolstered by the use of teaching materials that include narratives that imitate real-world scenarios.

In order to keep students interested for longer, Deterding et al. (2011) argue that narratives should be used. The study's findings shed light on the ever-present link between narrative variables and the learning curve that leads to mastery of a skill. In other words, when students are engaged in narrative-rich gamified learning contexts, they are more likely to pay attention and retain information. Because maintaining students' interest and engagement in traditional classroom settings has been a problem in Saudi Arabia, narrative-based gamified learning offers a promising solution. Teachers may use the captivating quality of stories to create a stimulating classroom setting that piques students' interest and keeps it piqued while they gain knowledge and develop their abilities.

6. Conclusion

This study demonstrates that using gaming elements in the classroom may significantly increase interest and enthusiasm. Students' increased skill development is a direct outcome of their participation in gamified learning environments, as seen by the strong positive correlation between the two. The findings have particular significance in Saudi Arabia, where educational reform initiatives like Vision 2030 stress the importance of equipping students with the necessary skills to thrive in today's increasingly interdependent global society.

This study demonstrates the critical role that storytelling plays in the setting of game-based education. Although the average score for narrative impact was low, the existence of a positive correlation between this variable and skill acquisition suggests that story plays a substantial role in facilitating skill development inside instructional games. This finding emphasizes the need to continue to investigate the role of narrative strategies inside gamified settings and how they might positively affect students' academic performance. Teachers in Saudi Arabia may take use of the country's long-standing tradition of telling tales to provide lessons that are both culturally relevant and accessible to students of all ages.

The study highlights the importance of Narrative Variables as main markers of skill growth in game-based learning environments. This strong positive correlation between narrative variables and skill acquisition highlights the importance of tale coherence, character development, and well-structured plots in enhancing students' learning journeys. This finding is in line with the goals of Saudi Arabia's educational reforms, which aim to better prepare students for the knowledge-based economy.

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