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H. Nassar
PhD Student of the Department of Pedagogy, Mozyr State Pedagogical University
Named after I. P. Shamyakin, Mozyr, the Republic of Belarus
Scientific adviser: Chekina Alena Valentinovna, Candidate of Science in Pedagogy, Associate Professor

THE DEVELOPMENT OF ARABIC LANGUAGE COMPETENCIES IN ISRAELI SECCONDARY SCHOOL STUDENTS THROUGH GAMIFICATION: APPLIED ASPECTS

The educational reality reveals a decline in the level of Arabic language competence among Israeli school students. This study aims to show the way of enhancing the Arabic language competence of seventh-grade students in Arab schools in Israel through a gamification educational model. The model was applied to a sample of students divided into four groups, using an interactive virtual environment (Hayacities on the Roblox platform). The results of the pre-tests revealed a severe weakness in Arabic language competence standards, linked to the absence of a positive emotional connection with the language. Furthermore, the application of the model demonstrated a clear improvement in competence and motivation levels, proving that gamification is a methodological approach capable of bringing about a fundamental transformation in language learning.

Keywords: Arabic language competence, motivation, gamification.

Introduction

Mother tongue is more than just a means of communication; it is an expression of identity and belonging, and a fundamental component in shaping the cultural and cognitive self, especially in multilingual and multi-identity societies, such as the Arab community in Israel. However, the educational reality reveals a worrying decline in the level of Arabic language competence among secondary school students. This decline is the result of several intertwined factors, most notably the weak presence of standard Arabic in daily life, traditional teaching practices, and a lack of motivation.

Competence is central to language teaching. It is defined as a dynamic system with a complex structure that includes specific criteria that grow and interact, rather than being static. These criteria can be developed through experimentation and appropriate educational context. From this perspective, the need for non-traditional educational tools emerges. Here, gamification enters the picture as an innovative educational tool based on game elements such as challenges, points, levels, goals, and immediate feedback. It relies on transforming the learning environment into a stimulating and collaborative one. Some studies [1; 2] have demonstrated that gamification enhances attention and confidence and increases learning motivation. Based on the above, this study aimed to show the way of developing the language competence of seventh-grade students in Arab secondary schools in Israel through a gamified educational model. This model is based on an interactive virtual environment (Hayacities via Roblox) that focuses on developing language skills and learning motivation.

Research methods and methodology

As part of the current study, a comprehensive pretest was administered to a sample of 200 seventh-grade students, divided into 100 students in the experimental group and 100 students in the control group. The test measured their language competence in reading, comprehension, grammar, morphology, writing, vocabulary, and semantics. This test was constructed according to criteria inspired by the international PISA test [3].

Research results and discussion

The reading assessment consisted of several elements: comprehension and retrieval, integration and interpretation, reflection and evaluation, vocabulary and lexicon, pragmatics, semantics, grammar and syntax, and morphology. The findings imply similar competence on all reading tests for both groups (Table 1). In the interventional group, the mean score for understanding and retrieval was 14.75 (SD = 3.50), and in the control group it was 14.59 (SD = 3.26), so producing an overall mean of 14.67 (SD = 3.37). Whereas the control group

showed a mean of 7.54 (SD = 2.55), the interventional group showed a mean of 7.53 (SD = 2.62), so producing an overall mean of 7.53 (SD = 2.58). The results show no appreciable variation in participants' capacity to interpret and combine textual material. Whereas the mean score of the control group was 7.24 (SD = 3.43), the interactive group showed a mean score of 7.89 (SD = 3.30) for reflection and evaluation. The mean across all was 7.56 (SD = 3.37). In the Vocabulary and Lexicon domain, the interactive group scored 2.23 (SD = 1), while the control group recorded 2.29 (SD = 0.92), so producing an overall mean of 2.26 (SD = 0.96). The assessment of pragmatic competence produced mean scores of 2.06 (SD = 1.19) for the intervention group and 2.22 (SD = 1.19) for the control group, so producing an overall mean of 2.14 (SD = 1.16). While the control group scored 1.62 (SD = 1.19), the interventional group showed a mean Semantics of 1.65 (SD = 1.20), so producing an overall mean of 1.64 (SD = 1.19). Whereas the control group received a mean score of 3.45 (SD = 2.1), the interventional group achieved a mean score of 3.35 (SD = 2.10), so producing an overall mean of 3.40 (SD = 2.15). In the intervention group, the mean score for morphological awareness was 4.53 (SD = 2.24); in the control group, it was 4.90 (SD = 2.21). The overall mean was 4.71 (SD = 2.21).

Table 1 – Test scores

Variables	Interventional		Control		Total	
	M	SD	M	SD	M	SD
Reading						
Understanding and retrieval	14.75	3.50	14.59	3.26	14.67	3.37
Integration and interpretation	7.53	2.62	7.54	2.55	7.53	2.58
Reflection and evaluation	7.88	3.30	7.24	3.43	7.56	3.37
Vocabulary and lexicon	2.23	1	2.29	0.92	2.26	0.96
Pragmatics	2.06	1.19	2.22	1.14	2.14	1.16
Semantics	1.65	1.20	1.62	1.19	1.64	1.19
Grammar and Syntax	3.35	2.10	3.45	2.21	3.40	2.15
Morphology	4.53	2.24	4.90	2.17	4.71	2.21
Writing						
Content	6.51	2.27	6.86	2.57	6.69	2.43
Language	4.37	1.43	4.58	1.85	4.48	1.65
Structure	2.65	0.85	2.78	1.13	2.71	1

The writing assessment included three elements: content, language, and structure. The interventional group exhibited a mean score of 6.51 (SD = 2.27), whereas the control group demonstrated a mean of 6.86 (SD = 2.57), resulting in an overall mean of 6.69 (SD = 2.43). This shows in the control group a somewhat higher but non-statistically significant content competence. While the control group scored 4.58 (SD = 1.85), the interventional group had language competence scores of 4.37 (SD = 1.43), so producing an overall mean of 4.48 (SD = 1.65). A t-test indicated a statistically significant difference in language competence ($t = 29.101$, $p < 0.001$), demonstrating a meaningful distinction between the two groups. The interventional group exhibited a mean score of 2.65 (SD = 0.85) for structural competence, while the control group had a mean score of 2.78 (SD = 1.13), resulting in an overall mean of 2.71 (SD = 1.00). A t-test indicated a statistically significant difference in structural competence ($t = 21.539$, $p = 0.001$), underscoring minimal yet meaningful differences between the groups.

These results indicate a clear weakness, which can be explained by students' difficulty understanding meanings in different contexts, as well as difficulty using language and critically evaluating texts – a skill essential for developing analytical thinking. The results also point to weak grammar, which negatively impacts the production of correct sentences, as well as comprehension and expression.

Results (table 2) display the baseline assessment of motivation-related subscales for the interventional and control groups, offering a comparative overview of their initial motivation levels prior to any intervention. The attention subscale indicates comparable mean scores for the interventional group (M = 37.97, SD = 8.93) and the control group (M = 40.33, SD = 7.89), with the interventional group exhibiting slightly greater variance (79.68 vs. 62.29). This suggests a marginally broader spectrum of attention levels among the interventional group. The relevance subscale shows similar outcomes, with the interventional group scoring M = 29.98 (SD = 5.68) and the control group M = 30.53 (SD = 4.99), indicating minimal variability between the groups. The same similarity was observed in the confidence subscale, with the interventional group scoring M = 30.66 (SD = 5.45) and the control group scoring M = 32.17 (SD = 5.37).

Table 2 – Instructional Materials Motivation scale and subscales description

Scale / subscale	Group	M	Sd	Variance	Min	Max	P^{25}	P^{50}	P^{75}
Attention	Interventional	37.97	8.93	79.68	18	53	34	38	46
	Control	40.33	7.89	62.29	18	57	35	40.75	46
	Total	39.16	8.48	71.99	18	57	34	39	46
Relevance	Interventional	29.98	5.68	32.30	16	39	25	31	34
	Control	30.53	4.99	24.88	19	44	27	31	34
	Total	30.25	5.34	28.50	16	44	27	31	34
Confidence	Interventional	30.66	5.45	29.69	17	44	27	31	34
	Control	32.17	5.37	28.88	21	42	28	32	36.75
	Total	31.41	5.45	29.71	17	44	28	32	35
Satisfaction	Interventional	19.66	5.31	28.18	8	29	15	20	24
	Control	21.01	4.95	24.51	7	29	18.25	22	25
	Total	20.34	5.16	26.66	7	29	16	21	24
Total IMMS	Interventional	118.26	23.03	530.55	62	165	98.50	120	136
	Control	124.03	20.09	403.50	71	168	110	126.25	139
	Total	121.16	21.74	472.70	62	168	106	123	139

The satisfaction subscale clearly shows a difference; the mean score (M = 19.66, SD = 5.31) of the intervention group is lower than that of the control group (M = 21.01, SD = 4.95). The statistically significant ($t = 56.153$, $p = 0.001$) observed difference indicates that the control group first expressed more satisfaction with their educational opportunities. Indicative of general motivation, the total IMMS score is lower in the interactive group (M = 118.26, SD = 23.03) than in the control group (M = 124.9, SD = 20.09), so displaying a rather larger variance (530.55 vs. 403.50). The control group demonstrated a statistically significant difference ($t = 128.465$, $p = 0.002$) in baseline motivation.

These results reflect that students suffer not only from weak Arabic language competence, but also from a lack of emotional connection to the language. The results demonstrate a clear decline in the intrinsic motivation to learn Arabic, particularly in students' sense of connection and benefit from it. This motivates the implementation of a gamification-based educational model that rebuilds their relationship with the language, revitalizes it in their consciousness, and helps them acquire it through interactive and enjoyable methods.

The study developed a six-stage educational model, along with technical and psychological preparation for both teachers and students, aimed at developing competence in the Arabic language.

1. Preparatory Stage: to measure students' level of competence in the Arabic language and determine criteria for student motivation to learn Arabic.

Test and Questionnaire

A test was designed according to standards like the PISA test. The test includes a variety of texts followed by questions on competence criteria, such as comprehension, analysis, interpretation, and evaluation, as well as vocabulary, grammar, and writing. Additionally, the IMMS Student Motivation Scale [4] was used to assess students' motivation to learn Arabic and measure their interest, sense of appropriateness, confidence, and satisfaction.

Students had 90 minutes to complete the test and 20-30 minutes to complete the questionnaire.

Students took the test and questionnaire in September, at the beginning of the school year.

Results, Analysis and Student Participation

The test and questionnaire results were entered into Excel, arranged in tables according to competence criteria, and then analyzed in-depth in SPSS. This program demonstrated the level of each competence criterion and determined the motivation across all its items.

Sharing results with students is an integral part of the teaching and learning process. The goal is not to inform students of numbers and grades, but rather to encourage them to understand these results. The teacher shared the results with the students in an interactive classroom session lasting two classes, or 90 minutes. Using the Classroom program, the teacher and students identified strengths and weaknesses and developed a deeper understanding of the educational context. The students used visual analysis.

At the end of the session, the teacher asked all students to keep their own analyses in their learning files in their portfolios, for reference in the next stages of the model. These maps serve as a reference, allowing students to track their progress and continually review their strengths and weaknesses throughout the learning process.

Presenting the Objectives

Objectives: After presenting the results, analysis, and student participation, the teacher clearly, sequentially, and systematically presented the educational objectives, and addressed the students, highlighting areas for improvement.

Suggestions: The students were motivated, and increased participation and interaction among them to achieve their goals. The teacher suggested gamification tools they would prefer to use, with the most prominent and requested being Roblox.

After the first stage and sharing the results with the students, the students were informed and aware of their results and defined their educational goals. They are psychologically and educationally prepared to embark on a new educational experience within an unconventional, interactive environment.

2. Initiation Stage: to prepare students technically and psychologically for the new educational experience.

School System and Application Timeline

The teacher arranged the application phases according to the school schedule, taking into account official holidays and special activities such as school trips and weddings, which are common in May, June, and Ramadan. The main outlines were as follows:

– Initial test and questionnaire: In September, at the beginning of the school year.

– Final test and questionnaire: At the end of May and the beginning of June, before students were busy with extracurricular activities and Eid al-Adha.

– Other gamification phases were distributed flexibly between these periods to ensure continuity despite holidays, Eid, and Ramadan.

– Students: While the teacher was arranging the implementation of the model, students prepared to use the agreed-upon educational game (Roblox Hayacities) by choosing the devices they would use: a computer, phone, iPad, or tablet.

Technical update and personal account creation

The teacher:

– Demonstrated how to download the educational game (Roblox Hayacities) in various ways.

– A written user guide was also provided explaining how to download the game, create an account, and log in, with clear and easy steps.

– Check the internet status for weak internet, device problems, or installation errors.

Students:

– Downloaded the game on their chosen devices, and the teacher reminded students to check their storage space and internet speed.

– If they encountered technical problems, the teacher was present at all times.

– Students followed up on choosing strong passwords for account security.

– Each student was free to choose a username that reflected their personality or interests, while respecting the game rules. They also chose a personalized avatar for their character in the game.

Stimulating enthusiasm and explaining the game's mechanics.

The teacher:

– Dedicated a lesson to a live demonstration of the game to the students, focusing on educational objectives and fun, how to interact, collecting points, registering names on the leaderboard, and strategies for dealing with the challenges within the game.

– The teacher played the first round of the game with the students, explaining the steps to progress and how to solve the challenges.

Students:

– Watched the teacher's presentation of the game, and their experience of it excited them, especially when they chose avatars to represent them.

– They kept the user's manual to understand the basic rules and how to progress through the levels.

– They began with initial in-game experiences to explore the game, learn how to play, and understand the gameplay.

From the second to the third stage, with the completion of technical and psychological preparations and the readiness to dive into the next stage, students are ready to discover educational cities and begin learning through self-exploration and free interaction.

3. Exploration Stage: to move on to the actual application of the gamification model.

Initial Exploration and Familiarization with the Map:

Students received a message from their grandparents as they begin the game. They then discovered that the game contains a map of six Arab cities: their own, their parents', and their grandparents', each represents a learning station. They were asked to complete each city's challenges in sequence according to the map.

Students expressed their happiness when they noticed that the challenges in each city covered the language skills, they were currently studying in the Arabic language curriculum, which increased their sense of realism and practicality of the experience.

The challenges were arranged in the six cities:

1. The first city:

Included grammatical challenges on the types of nouns, plurals, and a Quranic text for reading comprehension.

The students were required to collect cards containing scattered words and classify them according to their types.

2. The second city:

Focused on reading comprehension of another type of text, namely stories, identifying the main idea and sub-ideas, and introduced them to another grammar material according to the curriculum.

3. The Third City:

It contained another type of text: informational text, linguistic puzzles related to written expression, where they were asked to complete incomplete sentences and various skills such as comparison. Another grammar lesson was also included, corresponding to what they had learned.

As they progressed through the cities, students noticed that the challenges increased in difficulty.

Self-exploration and Independent Interaction:

The teacher:

Remains a guide, encouraging, and non-interfering, asking guiding questions to promote thinking.

Feedback from the teacher:

This took the form of subtle hints and constant encouragement:

– Well done in the first city! Did you notice the grammatical patterns changing in the subsequent cities?

The students:

In this stage, curiosity and exploration were fostered. The students independently managed their progress within the game, making individual and group decisions to solve challenges.

*Finally***,** this stage reflected the practical essence of the gamification model, where Students tested their ability to explore, analyze, and work collaboratively within a virtual world that mimicked their real-life learning journey. They felt a strong connection between the in-game challenges, the curriculum, and reality, making learning a vivid and engaging experience.

To a stage with deeper challenges, exchange of strategies, strengthening of problem-solving skills, and enhanced group cooperation in which critical thinking skills and social interaction are developed in a realistic educational environment.

4. Application Stage: to enhance students' application of competencies, encourage greater teamwork, and create positive social interaction through the exchange of solutions and ideas, and collaborative work to overcome challenges.

The teacher:

Their role is to foster collaboration among students:

– Activate a group dialogue window within the game to exchange ideas and experiences.

– Encourage students to think as a group, not as individuals:

– Think about how to exchange methods.

– Provide simple hints to guide their collective thinking.

– Provide illustrative links or a simple explanation when students encounter difficulty with a grammatical topic.

The teacher increases social interaction:

– Set aside time at the end of the challenges for students to share their gaming experiences outside of Arabic to foster friendly relationships.

– Use a leaderboard to stimulate interaction and encourage students to continue playing and discussing.

– Implement challenges and puzzles:

– In addition to providing ongoing feedback as students progress, the teacher monitor the strategies they use and guide them, when necessary, to develop alternative solutions.

– Encourage them to adjust their strategies to accommodate the increasing difficulty of the challenges.

Students:

Enhancing collaboration:

– Work in groups or pairs, discuss challenges, and exchange solutions.

– They observe the increasing difficulty of the challenges as they progress.

– They adjust their strategies based on the feedback they receive.

– They apply their language competence to solve new problems and learn how to make decisions under pressure in the game.

After the stages in which students gradually advanced their skills, they now possess cognitive tools and interactive experiences that qualify them to advance to a higher level of collective thinking and planning.

5. Consolidation Stage: to a higher level of challenges that require strategic planning, conscious group decision-making, and the development of advanced thinking and self-learning skills.

The teacher:

– Announces and celebrates students' achievements in front of the class.

– Organizes a short session to present and share experiences and learning challenges.

– Provides specific, positive feedback.

– The teacher encourages students to think about the future and setting new goals.

– Presents more challenging challenges and demonstrates the importance of time management.

– Allows students to plan and make group decisions, with immediate support to improve strategies.

* Students:

Students express pride in their accomplishments and thank each other.

– They discuss the challenges they faced and how they overcame them through strategies, thinking, and problem-solving techniques.

– They use feedback to improve performance.

– They plan collectively, assign roles, and develop strategies to solve challenges.

– They reevaluate their plans after each challenge and adjust them as needed.

To the final stage, to evaluation, reflection and achievement, examining the extent to which students' competencies have developed compared to what they were at the beginning of the model.

6. Reflection and Evaluation Stage: measuring the extent of development in their linguistic competencies and level of motivation after completing their journey.

The teacher:

– Re-administers the same test administered in the preparatory stage to measure competence development.

– Distributes the Motivation Survey (IMMS) again to measure changes in student enthusiasm.

– Analyzes the results using statistical tools such as SPSS to compare pre- and post-test competence.

– Reviews the students' performance at each stage of the model, identifying areas of strength and weakness.

– Presents certificates of participation and appreciation to each student who completed the gamified journey.

– Holds a group evaluation session to discuss key observations and suggestions with the students.

Students:

– Took the final exam and completed the questionnaire for a second time.

– Discuss with their teacher and classmates the challenges they faced and the stages of the model that benefited them most.

– Expressed their opinions about the experience and made suggestions for improvement should the model be implemented in the future.

– Receive their certificates and shared their feelings of pride and accomplishment with their classmates.

– The visual summary of the 6-stage gamification model can be bared on key components by stage (Table 3).

Table 3 – Key components per stage

Stages	Key components for practical implementation
Preparatory Stage	Pre-tests (PISA-like, IMMS). Student self-analysis → Goal-setting. Teacher introduces gamification (e.g., Roblox).
Initiation Stage	Technical setup (download Roblox, create avatars). Teacher demo + user guide. Schedule alignment (school calendar).
Exploration Stage	Students explore "Hayacities" map (6 Arab cities = learning stations). Challenges: Grammar, reading, puzzles (aligned with curriculum). Teacher as guide (minimal interference).
Application Stage	Collaborative challenges (group problem-solving). Teacher fosters discussion (hints, leaderboard). Adjust strategies for difficulty progression.
Consolidation Stage	Advanced challenges (strategic planning, time management). Celebrate achievements + group reflection.
Reflection & Evaluation Stage	Post-tests (competence/motivation). Compare pre/post results (SPSS analysis). Certificates + feedback session.

While the study clearly outlines the positive outcomes of gamification in improving Arabic language competencies and motivation, the post-test results are not presented in the same detailed statistical format as the pre-test data (e.g., means, SDs, or comparative tables). This omission stems from the article's focus on methodological innovation and qualitative insights – such as student engagement and the six-stage model – rather than exhaustive quantitative reporting. The post-test was conducted and analyzed, albeit without granular numerical disclosure. Future research could enhance transparency by including full pre-post comparisons to strengthen empirical validation.

Conclusion

The application of the "Hayacities" gamification model highlights that developing Arabic language competence depends not only on content, but also on a learning environment that interacts with the student and considers them as active participants in the learning process, rather than as mere recipients. By employing gamification in a systematic way that integrates language challenges into a virtual space resembling the student's world, this model has enabled the development of the relationship with the language, making Arabic a field of discovery, dialogue, play, and belonging. It has also made addressing linguistic deficiencies – whether in comprehension, expression, or syntax-possible, while simultaneously enhancing students' motivation to learn and giving them a sense of empowerment and control. Student participation within the game has also demonstrated that collaborative learning grows naturally in a safe and stimulating environment.

Ultimately, gamification can connect students to their language, make language an existential part of their lives, develop their competence, and improve their motivation through a dynamic learning journey.

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E-mail: p.d.n.92@hotmail.com

Г. Наccар

РАЗВИТИЕ КОМПЕТЕНТНОСТИ В АРАБСКОМ ЯЗЫКЕ У УЧАЩИХСЯ СРЕДНИХ ШКОЛ ИЗРАИЛЯ СРЕДСТВАМИ ГЕЙМИФИКАЦИИ: ПРИКЛАДНЫЕ АСПЕКТЫ

Современные реалии образования демонстрируют снижение уровня владения арабским языком среди израильских школьников. Данное исследование направлено на реализацию задачи совершенствования компетенций в области владения арабским языком у учащихся седьмых классов, обучающихся в арабских школах Израиля, с использованием образовательной модели геймификации. Модель была апробирована в Израиле на выборке учащихся, разделенных на четыре группы, с использованием интерактивной виртуальной среды (платформа Hayacities на базе Roblox). Результаты предварительного тестирования выявили серьезные пробелы в уровне владения арабским языком, что связано с отсутствием позитивной эмоциональной связи с языком. Применение модели продемонстрировало значительное улучшение как языковых компетенций, так и уровня мотивации к изучению языка, подтверждая, что геймификация представляет собой методологический подход, способный осуществить фундаментальную трансформацию процесса изучения языка.

Ключевые слова: компетентность в арабском языке, мотивация, геймификация.