Advancing Social Studies Education: Integrating Artificial Intelligence For Skill Development In Asir's Teachers

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Abstract:
This study aimed to utilize artificial intelligence technologies to enhance the development of twenty-first-century skills among social studies educators in the Asir region. The research employed a descriptive, semi-experimental methodology, utilizing artificial intelligence applications (such as CHAT GPT and NEARPOD) along with cognitive assessment tests and skill scorecards. The findings revealed a statistically significant difference in the average scores of the social studies educators in the sample, both in cognitive testing and skill assessment, before and after the application of the AI interventions, favoring the post-application phase.

Introduction:

In an era marked by rapid advancements in science and technology, it becomes imperative to continually enhance our institutions, particularly educational ones. Recognizing that teachers are the cornerstone of any educational process, there is a pressing need to consistently refine their preparation and skills, particularly in line with the demands of the twenty-first century. This includes fostering competencies in learning and innovation, information and technological literacy, as well as life and professional skills, essential for effective teaching and navigating modern advancements. Such efforts aim to elevate both educators and students, cultivating a generation equipped to confront future challenges and meet the evolving demands of the job market.

The Kingdom of Saudi Arabia, committed to spearheading progress and development, has prioritized education within its Vision 2030 agenda, emphasizing its pivotal role in nurturing a responsible and adept generation capable of meeting the demands of the new century. Central to achieving this vision is the continuous professional development of teachers, recognizing their pivotal role in driving educational reform and success (Ministry of Education, 2016).

Various studies and research underscore the necessity of enhancing twenty-first-century skills among educators. Examples include studies by Al-Masabi (2018) and Al-Ghamdi and Al-Qahtani (2016), alongside conferences such as the

"Vision for the Development of Education in Egypt" conference in 2015 and the Fifth Conference for Teacher Preparation at Umm Al-Qura University in 2016. These platforms highlight the imperative for contemporary teachers to master modern skills.

In the Kingdom of Saudi Arabia, numerous studies have assessed teacher performance across different disciplines. For instance, Al-Roqi's (2018) study revealed shortcomings in the teaching performance of Arabic language instructors at the secondary level in alignment with Vision 2030. Similarly, Al-Mujlad's (2017) evaluation of social studies teachers found performance levels to be average, recommending in-service training programs for improvement. Other studies, like Al-Taweel (2016), emphasized the need for specialized training courses to enhance the teaching performance of primary school teachers in Riyadh. Al-Shehri's (2014) study on science educators highlighted a lack of attainment of high performance levels among the sampled teachers, underscoring the importance of aligning teaching practices with professional standards.

From the previous presentation, we conclude the importance of reaching modern strategies used in teacher professional development programs, including: Online professional learning communities, which are key to improving teaching and learning, and this model provides an approach in schools to organize teachers, to achieve common goals in which teachers are mutually responsible, with a process to ensure that teams clarify the necessary basic lessons, for the interests of The team, and to help each member realize the strengths and weaknesses that govern their performance.

Baildon, M., & Damico, J.2014 highlighted the experiences of professional learning with technology for social studies teachers, as well as Mohammad Farisi's (2016) study on the need to develop the skills of social studies teachers in the twenty-first century through technological integration, and that social studies make innovations related to twenty-first century skill changes.

According to the aforementioned importance of the field of artificial intelligence and investment in it, which has become one of the directions of the Kingdom of Saudi Arabia in various institutions and sectors, most notably the education sector, many studies have emerged that explore and analyze the reality of artificial intelligence applications in education to identify the challenges and obstacles facing these applications and work to facilitate them for the benefit of the educational process (Al-Hujaili and Al-Farani, 2020; Al-Hakami and Mudawi, 2023).

In addition, the study of Al-Ghamdi and Bakhit (2023) indicated that the Kingdom has always wanted artificial intelligence to be a good option to work to improve the quality of education to the maximum possible degree, and that the use of artificial intelligence applications has a positive impact on

the quality of the educational process, which results in improving the skills and levels of learners, so this study recommended that work must be done to develop and keep pace with artificial intelligence applications to raise the level of quality of education and its services provided to learners, in addition to urging officials to rely on these Applications, encouraging them and facilitating their use in the educational process.

Social studies teachers (Richard Cairn, 2018) need to be proficient in dealing with artificial intelligence applications, as these skills enable them to contribute to the world of work, participate effectively in society, and enable them to use cognitive and technical tools to qualify them for lifelong learning (Al-Masaeed, 2017).

From the previous presentation, it is clear the need to support the professional development of teachers by employing artificial intelligence applications in order to develop the skills of the twenty-first century, especially among social studies teachers, and this is what the current research seeks to achieve.

Research problem.

The problem of the current research is summarized in the importance of twenty-first century skills, and that they are necessary for social studies teachers, in light of the development of knowledge and technology in this era, but the reality may indicate a decline in the acquisition of these skills and in the ability to develop them among students, and this may be due to several reasons, including a lack of performance of social studies teachers , whether in terms of preparation or qualification, as well as accreditation On the traditional methods in their professional practice, which prompted the researcher to conduct an exploratory study to identify the extent to which social studies teachers know the skills necessary for the twenty-first century teacher, and the results of the application of the opinion poll showed the extent to which teachers possess knowledge of the components of the twenty-first century skills, and their percentage was (32%), as for the extent to which they possess some of the skills necessary to employ the skills of the twenty-first century, it was found that 92% of the percentage of female teachers do not have As for the extent to which such skills are applied and linked to work, 90% of teachers indicated that they need cooperation, sharing and communication through artificial intelligence applications, and the study of Al-Ajlan (2022) stated that artificial intelligence applications are a distinct technical option for its effective contribution to the success of public education, in light of the Kingdom's Vision 2030, and the study also recommended Al-Talhi and Al-Amiri (2023) on the importance of the Ministry of Education in the Kingdom of

Saudi Arabia adopting the modern trend aimed at employing artificial intelligence applications in education and its great role in the progress of education. This is confirmed by the study of (Coyne, J., Potter, J., & Hollas, T, 2013) of the need to link the professional development of teachers with technological applications; to provide them with twenty-first century skills in a functional way that contributes to achieving the objectives of the curriculum.

 Therefore, it is clear that there is a large gap between the training that teachers receive in the educational institution and those they need in life and work in the society of the knowledge age, which is what the current research seeks to achieve by answering research questions.

Research Questions
1. What are the twenty-first century skills needed for social studies teachers in Asir region?
2. What is the educational design framework needed to employ artificial intelligence applications in developing twenty-first century skills among social studies teachers?
3. What is the effectiveness of employing artificial intelligence applications in developing the cognitive aspect thatis needed for the twenty-first century skills among social studies teachers in Asir region?
4. What is the effectiveness of employing artificial intelligence applications in developing the skill side of thetwenty-first century skills among social studies teachers in Asir region?

Research Objectives
The objective of the current research is to:
1. Identify the twenty-first century skills necessary to acquire them for social studies teachers in Asir region.
2. Determine the educational design framework necessary to employ artificial intelligence applications in developing twenty-first century skills among social studies teachers .
3. Develop a list of artificial intelligence applications for social studies teachers .
4. Identifying the effectiveness of employing artificial intelligence applications meets the development of the cognitive and skill aspect necessary for the twenty-first century skills among social studies teachers in Asir region.

Importance of Research:
The current research relevance lies in:
1. Contribute to the development of programs for the preparation of social studies teachers in line with the

requirements of the twenty-first century and achieve the Kingdom's Vision 2030.

2. In response to keeping pace with global trends as well as the Kingdom's Vision 2030 in education in general, and teacher training programs and training them in particular.

3. Consider the methods of training teachers and preparing them during service in the light of artificial intelligence applications.

4. Provide a list of twenty-first century crisis skills for social studies teachers, which should be taken into account in teacher preparation programs and in-service training programs.

Search Tools: The current research has been limited to the following tools:

1- DESIGN OF THE ARTIFICIAL INTELLIGENCE APPLICATION EMPLOYMENT ENVIRONMENT (CHAT GPT-NEARPOD)

2- Testing the cognitive aspect of the skills of the twenty-first century.

3- Skill assessment card for the skills of the twenty-first century.

Research sample: The research sample consisted of 34 social studies teachers in the intermediate stage in the Asir educational area, and they were identified as a group and an experimental one.

Research Methodology:

The current research relied on the following approaches:

1. **Descriptive approach:**   The researcher used the descriptive approach to describe and analyze previous studies and research related to the research problem, prepare the experimental environment, and research tools, as well as define a framework for educational design commensurate with the nature of the research.

2. **Semi-experimental approach:** The researcher used the semi-experimental approach in artificial intelligence applications and it was identified (CHAT GPT- NEARPOD), and applied to middle school parameters and measured its impact on twenty-first century skills.

Experimental Design of the Research:
The research sample consisted of one experimental group to which the pre- and post-measurement of the research tools is applied.

Search limits

The current research was limited to:

1. Objective limits: twenty-first century skills, and artificial intelligence applications (CHAT GPT- NEARPOD).
2. Spatial boundaries Asir Educational Zone.
   3. Time limits: Academic year 1444
   4. Search terms

Artificial Intelligence Applications :

- Artificial Intelligence Applications: (Artificial Intelligence Applications)

Abdulmutalib (2020) defined AI applications as: " Tools that make machines think like humans, that is, computers with brains. "

The researcher defines the applications of artificial intelligence procedurally in this research as: applications such as (CHAT GBT, Nearpod), which have certain characteristics that make them simulate the human mental abilities and higher thinking skills of students, and the ability to learn and conclude in the geography course is the most important of those characteristics.

Twenty-first Century Skills
It is defined (Khamis, 152, 2018) as "a set of skills that workers in various work environments need to be active, productive, and even creative members as well as mastering the knowledge content necessary to succeed, in line with the developmental and economic requirements of the twenty-first century."

The researcher defines it procedurally: as the set of knowledge and skills necessary for social studies teachers , to be able to develop them among students, and it consists of (critical thinking, problem solving , communication and participation, culture and information literacy, and technological literacy).

Second: Research Procedures:
The current research aimed to reveal the effectiveness of employing artificial intelligence applications in developing the skills of the twenty-first century among social studies teachers in the Asir region, and to achieve the goal of the research, the researcher reviewed and studied the foundations for artificial intelligence applications, as well as identifying the criteria for their design and determining the most appropriate educational design models and then setting the procedural foundations for the implementation of the research and it included:
First: Determining the research community: The research community consisted of social studies teachers in the Asir educational region in (1444) and their number is (34) teachers.

Second: Selection of the research sample: The research sample consisted of:

I- Exploratory sample: It consisted of (5) female teachers in the same academic year 1444 with the aim of controlling and codifying various research tools and was excluded from the basic sample of the research.

II- Basic sample: It included the selection of one group of social studies teachers in the Asir educational area, numbering (34) teachers and randomly selected, who wished to go through the experiment.

Third: Experimental Design of the Research:

The current research relied on one of the quasi- experimental research designs, which is a pre-post design for one group, in order to identify the effectiveness of employing artificial intelligence applications in developing the twenty-first century skills among social studies teachers in Asir region.

Fourth: The instructional design model necessary to implement the current research:

Looking at the design standards and models , it became clear to the researcher that the butcher model 2002 was suitable for the current research due to its common use , especially with design and training, which is the model proposed in the current study for the design and production of artificial intelligence applications in the development of twenty-first century skills The model has gone through the following steps:

1: Planning Phase: This stage includes the following processes:

I- **Identifying topics involved using artificial intelligence applications:** It includes content for twenty-first century skills: (critical thinking and problem solving, communication, sharing, culture and information literacy, and technological literacy).

II- **Define and formulate general objectives:** The environment used aims to strengthen the twenty-first century skills of social studies teachers.

III- **Setting and formulating behavioral goals:** By the end of the study of the necessary content for twenty-first century skills, it is expected that female teachers will be able to: Benefit from critical thinking and problem-solving tools for social studies teachers, and benefit from outstanding efforts The use of technology in literacy for social studies teachers, the ability of teachers to communicate and participate, and Identify digital literacy and information literacy skills.

IV- Content division and organization: The content was divided according to the environment of artificial intelligence applications, namely: Critical thinking and problem-solving tools for social studies teachers Benefiting from outstanding efforts Using technology in literacy for studies teachers, identifying the most

important communication and sharing tools for social studies teachers, and identifying digital culture skills and information literacy,

2: Analysis Phase: This stage includes the following processes:

I- Determining the characteristics of the parameters: The researcher has verified that the content is in line with the psychology of the teachers in terms of level, needs and tendencies, and that all teachers have devices, whether computers or tablets connected to the Internet outside the school hours.

II- Educational environment, resources and resources: Electronic requirements and means of computers, tablets, and the Internet have been identified.

3: Design stage: It has gone through the following stages:

I- Resource collection: The researcher identified the use of the Internet, and reliance on digital resources, which contained text, images, animations, two- and three-dimensional graphics, and the human voice.

II- Designing a learning environment using artificial intelligence applications: The researcher hired a specialist in designing educational and training environments. They were given permission to access each of the parameters so that they could communicate and share through the applications.

III- **Designing the education strategy, and interacting with applications:** The learning strategy is a general and customized plan, and the researcher has chosen the blended learning strategy in order to achieve the goals of employing artificial intelligence applications.

IV- **Evaluation of the environment of artificial intelligence applications after design:** After completing the design of the designed environment, it was tested for use by presenting it to a group of arbitrators who specialize in educational and computer technologies, and this is a good indicator of the safety of steps and procedures.

4: Application stage: After the completion of the design of artificial intelligence applications, give the link to the parameters of the sample members and determine its address, and thus it became ready for use online, and then the researcher conducted training meetings on methods of use for the experimental group before starting the research experiment.

5: Evaluation stage: The aim of this stage is to measure the effectiveness of employing artificial intelligence applications in developing the skills of the twenty-first century, and it has relied on two types: formative evaluation, where the evaluation is preliminary after each stage of learning, and the final evaluation.

Sixth: Research Tools

Steps to prepare a cognitive test of twenty-first century skills among social studies teachers**.**

1. Objective of the test: The cognitive aspect associated with twenty-first century skills.
2. **Test content determination:** Analyze content objectives into cognitive goals, performance goals, and categorize learning objectives, including determining what teachers should reach after completing their study of the contents in each lesson, and formulating them in a measurable procedural form.
3. **100%**: After the researcher analyzed the content with its basic elements, determine the relative weight of the topics of each unit as shown in the table based on the percentage of the number of sub-elements present in each of the lessons, which are as follows:

M	Lessons	Number	Ratio
1	Sharing	5	18%
2	Critical thinking and problem-solving tools for social studies teachers.	6	21%
3	The use of technology in literacy.	6	21%
4	Communication and sharing tools for social studies teachers.	5	18%
5	Digital Culture and Information Literacy Skills	6	21%
6	Total.	28	100%

Formulation of test vocabulary: When formulating test vocabulary, it was taken into account that it is of the type of restricted response (multiple choice) and multiple choice questions are one of the most objective types of questions in terms of their use and suitability to measure learning outcomes, due to the ease of correction, and its lack of impact on the guessing factor.

The initial image of the test: The researcher prepared the initial image of the test, and then presented it to the specialized arbitrators in order to identify the following: The correctness of the formulation of scientific and linguistic vocabulary In light of what was proposed by the arbitrators, the researcher made the required adjustments and the test became composed of 28 Paragraph, and then the researcher applied it to the exploratory sample in order to measure the ease and difficulty as well as the test time set time 350 / 5 = 70 test time, and the quantitative estimate of the test test score = 28, and thus the score is calculated for each correct question.

2- Steps to prepare the skill **scorecard** for the twenty-first century skills among social studies teachers**.**

1. Determining the objective of the skill scorecard: Measuring the performance aspect of the twenty-first century skills skills among social studies teachers.

2. 100%: Each main skill has been analyzed into a set of sub-skills, which were formulated in the form of procedural phrases, and they were presented to a group of specialized arbitrators and the following conditions were taken into account in their formulation: simplicity, drafting, and ease of application and after making the necessary adjustments, the card has consisted of **the following main and sub-skills:**

M	Lessons	Number	Ratio
	Critical thinking and problem-solving tools for social studies teachers.	8	27%
	The use of technology in literacy.	6	20%
	Communication and sharing tools for social studies teachers.	9	30%
	Digital Culture and Information Literacy Skills	7	23%
	Total.	30	100%

Quantitative estimation of the skills included in the skill performance evaluation card The researcher used quantitative estimation implemented = 2, implemented to some extent = 1, not implemented = 0 and thus the maximum score becomes 2 * 30 = 60 and the minor = zero.

Seventh: Analysis , discussion and interpretation of the results.

In this step, the results of employing artificial intelligence applications in developing the twenty-first century skills of social studies teachers in Asir region were analyzed and interpreted.

To answer the validity of the first hypothesis, which states:

There is a statistically significant difference at the level of (≤0.05) between the average scores of the social studies teachers of the sample members in the cognitive test of the twenty-first century skills between the pre- and post-application in favor of the post-application.

The researcher applied the test and the T-test was used for one group (Paired Samples T test.) using the statistical package SPSS for windows (V 22), in order to calculate the significance of the differences between the average scores of the parameters members of the experimental group in the

cognitive side test between the application before and after and they were as follows:

Function for dimensional applicationAverages and standard deviations and the value of (T) to indicate the difference between the average scores of the students of the sample in the pre- and post-application in the cognitive test.

Search tool	Experimental Group N (34)				Degree of freedom	Value (v)	Significance at (0.05)
	Tribal Application		Dimensional Application				
	Average	Standard deviation	Average	Standard deviation			
Cognitive Testing	6.44	0.82	23.94	1.77	33	52.54	Function for dimensional application

It is clear from the previous table that the value of (T) in the dimensional application of the experimental group was high (52.54), as well as the averages and standard deviations in favor of the dimensional measurement, by obtaining a statistically significant value at the level of (**0.05**) and this indicates a statistically significant difference between the degrees of social studies teachers in the pre- and post-applications to test the cognitive aspect of the twenty-first century skills.

Which indicates the effectiveness of the experimental treatment material used in the current research Employing artificial intelligence applications in developing the skills of the twenty-first century had an effective impact on the cognitive aspect (collection) of social studies teachers Thus , the researcher accepts the hypothesis that there is statistical significance at the level of significance (≤ 0.05) and the results of the research are consistent with the study of Zainab Abdullah Al-Zayed, Susan Hussein (2016), and the study ofHardman, Elizabeth L., 2012), study (Baildon, M., & Damico, J.2014) that professional learning communities with technology are useful for social studies teachers, as they help to improve the cognitive aspect, and their teaching practices, and the researcher attributes all of the above to the importance of the concept of a professional learning community with artificial intelligence applications that focused on the professional development of teachers In line with the requirements of the twenty-first century, and employing artificial intelligence applications, to develop the twenty-first century skills that they need.

To answer the validity of the second hypothesis, which states:

There is a statistically significant difference at the level of (≤0.05) between the average scores of the social studies teachers of the sample members in the skill scorecard for the skills of the twenty-first century between the pre- and post-application in favor of the post-application.

The researcher applied the skill performance evaluation card and the T-test was used for one group (Paired Samples T test.) using the statistical package SPSS for windows (V 22), in order to calculate the significance of the differences between the average scores of the parameters members   of the experimental group in the skill scorecard between the pre- and post-application and they were as follows:

Function for dimensional application

Search tool	Experimental Group N (34)				Degree of freedom	Value (v)	Significance at (0.05)
	Tribal Application		Dimensional Application				
	Average	Standard deviation	Average	Standard deviation			
Skill Scorecard	14.38	2.57	54.44	2.58	33	68.31	Function for dimensional application

It is clear from the previous table that the value of (T) in the post-application of the experimental group was high (68.31), as well as the averages and standard deviations in favor of the dimensional measurement, by obtaining a statistically significant value at the level of (**0.05**) and this indicates a statistically significant difference between the degrees of social studies teachers in the pre- and post-applications to test the skill side of the twenty-first century skills.

Which indicates the effectiveness of the experimental treatment material used in the current research Employing artificial intelligence applications in developing the skills of the twenty-first century had an effective impact on the skill performance of social studies teachers , and thus   the researcher accepts the hypothesis of the existence of statistical significance at the level of significance (≤ 0.05) and the results of the research are consistent with the study of Mohammad., FARISI, 2016), and the study of (Villanueva A, 2013) The development of the skills of social studies teachers in the twenty-first century through the integration of technology with knowledge, and the researcher attributes this to the fact that the applications of artificial intelligence have been used until they have become a powerful tool to mix education and professional learning by creating tools to improve practice, and encourage collective thinking and feedback, where best

practices have been developed to implement various tasks and performances to develop the skills of the twenty-first century, working on the integration of technology through Artificial intelligence applications to support critical thinking and problem-solving skills, communication and sharing skills, culture and information literacy skills, and technological literacy skills, thus affecting the performance of teachers in reducing the time to prepare and deliver lessons that (include technology, knowledge and skill of the teacher, attitudes and beliefs, and the ability to develop special technology).

 To answer the validity of the third hypothesis, which states:
Check AI applications (impact size ≥0.8) In the cognitive and performance aspects of the skills of the twenty-first century skills of social studies teachers.
 From the above, it is clear that the independent variable (employing artificial intelligence applications) has a statistically significant effect on the dependent variable (developing twenty-first century skills), but it does not indicate the size of the effect and to measure the size of the impact the researcher used**:**
   she stood up Researcher Using Equation of the square of the ETA η^2. This is based on the values of (T) resulting from comparisons between the average scores of the pre- and post-applications of the and the scorecard forTwenty-first Century Skills. where (η^2) represents The ratio of total variance in the variable by converting the value of the square of the eta (η^2) to the value of (d) By following the equation Next: $d = \frac{2\sqrt{\eta2}}{\sqrt{1-\eta2}}$،

Whereas, d are the size of the effect.
 Performance Appraisal Card Testing) of (cognitive and skill aspect) of the twenty-first century skills among social studies teachers

Search tool	Degree of freedom	Value (v)	Value (η^2)	Impact size1 (d)	Degree of impact
Cognitive Testing	**33**	**52.54**	**0,98**	**12.93**	**Large**
Performance Appraisal Card	**33**	**68.31**	**0,99**	**16.81**	**Large**

It is clear from the table that there is a statistically significant difference to the level of influence of the independent variable on the dependent variable, where it turns out that the value of

(the cognitive side, and the skill side) is acceptable for the first hypothesis, and the second of the research hypotheses and to identify the extent of the impact (employing artificial intelligence applications) on the dependent variable (twenty-first century skills) It is clear from the table that the value of the impact size (d) In (testing the cognitive side, and the skill side) of the twenty-first century skills, which is greater than the value set by Houston (0.8), which indicates that the employment of artificial intelligence applications, had a significant impact on the development of skills and knowledge necessary for the dependent variable in the current research of social studies teachers and this is consistent with the study of Caldarera J, 2013), and the Reitz study confirms, Hazel (2018) reported that there is a positive relationship between teacher practice in the classroom and professional development of social studies in learning environments using artificial intelligence, and the researcher attributes this to the diversity in strengthening skills through the development of mechanisms for communication and participation, and for this group of teachers, the use of the environment helped in two ways: setting educational goals and changing their thinking and actions in the practices that have been implemented through artificial intelligence applications

Results

In light of the previous presentation, it becomes clear:
> There is a statistically significant difference at the level of (≤0.05) between the average scores of the social studies teachers of the sample members in the cognitive test of the twenty-first century skills between the pre- and post-application in favor of the post-application.
> There is a statistically significant difference at the level of (≤0.05) between the average scores of the social studies teachers of the sample members in the skill scorecard for the skills of the twenty-first century between the pre- and post-application in favor of the post-application.
> Artificial intelligence applications (impact size ≥0.8) investigate the cognitive and performance aspects of the twenty-first century skills skills of social studies teachers.

Research Recommendations:

In light of the results of the research, the researcher was able to formulate the following recommendations: -
1. AI applications can become a supportive and enriching environment for teachers and students alike in implementing twenty-first century skills.

2. Due to the effectiveness of employing artificial intelligence applications in developing the skills of the twenty-first century among social studies teachers, these environments and applications can be used in training.
3. Diversity in the use of artificial intelligence applications for the professional development of teachers.
4. Identify the innovations of professional development necessary to develop social studies teachers and link them to professional development.

Proposed research.

In light of the results of the current research, the researcher proposes some of the following studies:
1. Designing an educational environment using artificial intelligence in teaching social studies.
2. Using artificial intelligence applications in developing creative thinking skills.
3. Employing artificial intelligence applications on smartphones to develop twenty-first century skills skills.

Conflicts of Interest: The authors declare no conflict of interest.

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