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# Employing artificial intelligence technologies to improve the efficiency of paramedic training programs in the Kingdom of Saudi Arabia: a descriptive and analytical study

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**Abstract:**

This study aims to investigate the role of employing artificial intelligence technologies in improving the efficiency of paramedic training programs in the Kingdom of Saudi Arabia. It relied on the descriptive analytical approach and was based on an electronic questionnaire applied to a sample of (200) participants working in the field of emergency and health training. The results revealed that artificial intelligence significantly contributes to the design of more interactive and realistic training programs, improves the speed and accuracy of paramedic responses in emergency situations, and provides accurate and immediate feedback to trainees and enhances decision-making skills during critical situations. The results also showed that artificial intelligence helps identify each trainee's needs individually and increases the efficiency of practical training compared to traditional methods. It also contributes to reducing costs in the long term and enabling the simulation of rare and complex situations that are difficult to provide in real-life training. The results also confirmed that the use of artificial intelligence enhances the motivation and self-confidence of trainees and raises their overall performance level, which was reflected in the rise in the arithmetic averages of all items above the neutral value (3) on the Likert scale, with high internal consistency of the measurement tool (Cronbach's alpha = 0.91). Accordingly, the study recommends expanding the integration of artificial intelligence technologies into paramedic training programs, developing advanced simulation systems that reflect rare and critical medical situations, and creating interactive digital training platforms that enhance training efficiency and reduce costs. It also recommends adopting educational and health policies that support technological innovation in line with the goals of Saudi Vision 2030.

**Keywords**: Artificial intelligence – Paramedic training programs – Efficiency improvement – Kingdom of Saudi Arabia – Descriptive and analytical study.

## introduction

The use of artificial intelligence technologies in training paramedics in the Kingdom of Saudi Arabia is an .important and pivotal step towards improving the efficiency and quality of emergency medical care Paramedics face many challenges that require them to make quick and accurate decisions under the pressures they are exposed to. Hence, the role of artificial intelligence emerges to provide innovative solutions. Artificial intelligence can provide a realistic simulation training environment through the use of .technologies such as virtual reality Augmented reality allows trainees to handle a variety of complex .emergency scenarios, such as major road accidents or heart attacks, in a safe and controlled environment This type of training enhances and strengthens paramedics' ability to recognize different situations and take .appropriate action more quickly and effectively 1,2

Artificial intelligence systems can also accurately and quickly analyze trainees' performance and identify their strengths and weaknesses. These systems use machine learning algorithms to provide personalized ,and immediate feedback to the trainee, helping them continuously improve their skills. For example .artificial intelligence applications can evaluate the quality of cardiopulmonary resuscitation Providing guidance on the depth and speed of compressions, this personalized training ensures that each paramedic receives the training they specifically need. AI technologies can also continuously update paramedic training programs by analyzing recent medical data and new protocols, and updating training scenarios accordingly. This helps ensure that paramedics in the Kingdom are always trained according to the latest and best global practices. AI applications can also contribute to more efficient management of training resources, such as scheduling training courses and assigning trainers, which reduces costs and increases future benefits 2,8

Therefore, artificial intelligence can be an integral part of the ambulance system itself, providing real-time decision-making support to paramedics while they are in the field

**Discussion**

**The concept of artificial intelligence and its development in the medical field**

Artificial intelligence aims to simulate human intelligence and includes a wide range of concepts and .technologies, the most important of which is machine learning It is a branch of artificial intelligence that focuses on developing algorithms that allow systems to learn from data and improve their performance over time without the need for explicit programming for each task. Through it, the system is told how to perform a specific task and is provided with huge amounts of data. By analyzing this data, it learns how to .recognize patterns and make decisions on its own. The second concept is artificial neural networks It is a computational model inspired by the structure of the human brain. These networks consist of layers of nodes called artificial neurons that are interconnected. Each node in a layer receives input from the nodes in the previous layer, processes it, and then passes it on to the nodes in the next layer, and so on. These networks are widely used in deep learning, an advanced branch of machine learning that uses multi-layer neural networks to solve complex tasks. The third concept is computer vision, which is a field of artificial intelligence that enables computers to see and understand images and videos in the same way that humans do. These technologies help systems extract meaningful information from visual data and make decisions based on it. These three concepts are interconnected and together form the basis of many artificial .intelligence applications used in everyday life 5,9

AI applications in medicine have evolved significantly with advances in machine learning and deep learning. In addition to the availability of vast amounts of medical data, AI now has the ability to analyze medical images with high accuracy and speed, aiding in the early and accurate diagnosis of diseases such as cancer and heart disease. AI algorithms can detect subtle signs in X-rays or MRIs that may be difficult for the human eye to detect. AI is also used in drug development, where it can analyze patients' genetic and clinical data to suggest personalized treatment plans. In surgery, AI-powered robots enable operations with superior precision and reduced surgical intervention. Despite these advances, AI remains a helpful tool, not a substitute for doctors, as the human relationship between doctor and patient is crucial8,9

- **The role of virtual simulation and augmented reality in first aid training**

Virtual simulation and augmented reality One of the radical transformations in first aid training is that it provides paramedics and trainees with practical skills in a safe and realistic environment. Virtual reality transports the trainee to a completely digital environment far removed from the real world by wearing special headphones in this environment. Trainees can practice complex and dangerous emergency scenarios such as major road accidents or natural disasters without any risks. Virtual simulation also enables them to interact with virtual patients and perform cardiopulmonary resuscitation Dealing with various injuries enhances muscle memory and improves their speed in making decisions under pressure This type of

training provides unlimited repetition of scenarios, allowing trainees to learn from their mistakes quickly and effectively 8,9

Augmented reality offers a different experience, but it is no less important than virtual simulation Instead of isolating the trainee from his environment, it integrates digital elements into the real world. The trainee can wearAR glasses or use a tablet to see additional information superimposed on the patient's body or the accident site. The augmented reality system can also display the patient's vital data, such as heart rate and blood pressure, directly over his body, or show the paramedic veins for easier injectionsThis enhances the paramedic's ability to analyze the situation and make decisions in real time, and enables him to obtain step-by-step instructions during the first aid procedure 4,9

Therefore, there are many and multiple advantages in trainingVirtual reality is ideal for creating environments for handling large and critical scenarios, while augmented reality focuses on enhancing practical training in a real-world setting. This combination provides comprehensive training that effectively covers both theoretical and practical aspects, enables accurate performance assessment, and provides ,immediate feedback to trainees. These technologies play a vital role in enhancing paramedic efficiency reducing human error, and improving patient care outcomes, particularly in emergency situations 8,9

- **Using smart algorithms in designing training content for paramedics**

Smart algorithms are used to design training content for paramedics. These algorithms customize the content to suit each trainee's individual needs. These algorithms analyze trainees' performance and behavioral data—for example, their response speed, decision-making accuracy, and weaknesses—to design a personalized learning approach for each trainee. This process is known as adaptive learning, and it increases and enhances the benefit of each training session. For example, if a trainee demonstrates weaknesses in dealing with trauma cases resulting from car accidents, the algorithm can focus on training them on similar scenarios and provide them with additional content on that topic until they fully master it9,7

These algorithms use machine learning to continuously analyze trainee data, enabling them to predict future needs and provide appropriate resources at the right time. They can also accurately and automatically assess trainee progress and provide immediate and detailed feedback. This eliminates the need for constant monitoring by the trainer, enabling them to focus on providing individual support to trainees who truly need it. Furthermore, intelligent algorithms contribute to dynamically updating training content by analyzing the latest medical protocols and data from real-life cases, adjusting training scenarios to reflect developments in the emergency field 6,9

Therefore, this approach not only enhances the efficiency of trainees but also contributes to directly improving patient care outcomes. When paramedics acquire the skills necessary to deal with various .emergency situations with high efficiency, they reduce errors and enhance the patient's chances of survival Furthermore, the use of these algorithms reduces the operational costs of training programs and improves the use of available resources in the future. These algorithms can become an integral part of first aid training platforms, providing a personalized and advanced learning experience for each paramedic. They also contribute to building a new generation of qualified paramedics who are ready for any emergency event 7,6

- **The impact of AI-based e-learning on improving efficiency**

AI-based e-learning directly contributes to improving the efficiency of paramedic training programs by .providing a personalized and effective learning experience Instead of following a standardized training curriculum, AI systems analyze each paramedic trainee's performance, such as their response speed in emergency scenarios, the accuracy of their decisions in critical situations, and their weaknesses in procedural skills. Accordingly, intelligent algorithms provide a learning path for each paramedic, focusing

on the skills they specifically need to improve, ensuring that every minute spent training improves their performance and outcomes8,9

AI systems can also correct errors and provide immediate feedback on trainees' performance in virtual simulation or augmented reality environments. This rapid interaction helps paramedics quickly understand and correct their mistakes, which accelerates the learning process and enhances their deep understanding of medical procedures. AI also provides additional support around the clock through chatbots and virtual assistants, enabling trainees to review procedures and protocols at any time without having to wait for the trainer. AI thus significantly improves teaching efficiency. Smart systems can perform administrative and routine tasks, such as assessing trainees' performance in various scenarios, saving trainers time that they can devote to direct interaction with paramedics and providing individual support to those who need it. AI systems also provide predictive analytics on trainee performance, identifying which paramedics may face difficulties in the future. This allows trainers to intervene early and provide the necessary assistance before the problem escalates. This accurate analysis enables trainers to make data-driven decisions to improve .their teaching strategies, which contributes to raising the overall efficiency of the training program 1,10

- **Smart assessment and its role in measuring trainee performance**

Smart assessment is a modern and extremely important approach to measuring trainees' performance. It relies on artificial intelligence techniques to provide an accurate and comprehensive analysis of their .performance, instead of traditional assessments, which are often subjective and limited This type of assessment not only measures theoretical knowledge but also analyzes practical skills, decision-making .ability, and rapid response in critical situations, instead of relying solely on human trainer assessment Smart assessment systems also use machine learning algorithms to analyze massive amounts of data .collected during training, whether in virtual simulation environments or through wearable devices 8,3

The smart assessment system can also analyze the trainee's performance during CPR. The system can also accurately measure the depth and speed of compressions and analyze the trainee's reactions and facial .expressions to identify stress levels This data is processed instantly and provides the trainee with personalized and detailed feedback on their performance, enabling them to correct their mistakes immediately. This continuous formative assessment enhances the learning process and accelerates skill acquisition. Additionally, smart assessment can provide predictive analysis of trainee performance, as smart algorithms identify trainees who may face future difficulties, allowing trainers to intervene early and provide the necessary support before the problem escalates. Smart assessment not only focuses on identifying weaknesses, but also includes identifying the strengths of outstanding trainees and designing .additional training paths to enhance them 2,11

Accordingly, Smart assessment is one of the most important pillars of modern paramedic training programs development. It represents a qualitative shift from traditional assessment to comprehensive and accurate assessment, instead of relying on the trainer's self-observation. Smart assessment uses artificial intelligence .algorithms to analyze trainees' performance objectively and in detail in simulation environments This analysis covers many aspects, such as the speed of decision-making, the accuracy of medical procedures, and even the paramedic's adherence to protocols These systems provide immediate and personalized . feedback to each trainee, enabling them to correct their mistakes immediately. This not only accelerates the skill acquisition process, but also increases and enhances the paramedic's self-confidence and .contributes to raising their efficiency and readiness for emergency situations 7,9

Therefore, smart assessment transforms performance evaluation from a routine administrative task into a powerful educational tool that contributes to raising trainees' efficiency and improving their readiness for real-life situations. This has a direct and positive impact on the quality of emergency medical care provided .to patients and injured patients 10,5

**Field of Study**

This study falls within the field of emergency medical education, with a particular focus on paramedic training programs in the Kingdom of Saudi Arabia. The research addresses the contemporary issue of integrating artificial intelligence technologies into healthcare training, given the significant role these technologies play in enhancing the efficiency of educational programs and achieving the strategic objectives of the Kingdom's Vision 2030 in the field of healthcare. The research also seeks to highlight the impact of artificial intelligence in improving rapid response skills, enhancing decision-making in critical situations, and developing a more interactive and realistic training environment.

**Methodology and Tools**

The study relied on the descriptive analytical approach, as it is most appropriate for the nature of the topic. It allows for the collection and analysis of field data from the research sample, leading to quantitative and qualitative results that can be scientifically relied upon. A robust questionnaire was designed, including a set of items measuring various dimensions, such as the effectiveness of AI training, its impact on cost reduction, and its role in enhancing trainees' motivation and self-confidence. The data were processed using appropriate statistical methods such as arithmetic means, standard deviations, and correlation coefficients to test the hypotheses.

**Research Tools**

The study relied on a primary data collection tool, a questionnaire, designed using a five-point Likert scale to assess participants' responses. It was designed with comprehensiveness and clarity in mind, covering several topics, including: interactivity and realism in training, immediate feedback, simulation of rare situations, the effectiveness of practical training, and motivation and confidence among trainees. The questionnaire was presented to a group of arbitrators to ensure its validity and reliability. The reliability coefficient was also verified using Cronbach's alpha coefficient, which showed a high value indicating the reliability of the tool and its suitability for scientific use.

**Table 1: Descriptive Statistics for Each Item (N=200)**

| Item | Mean | SD | Min | Max |
|---|---|---|---|---|
| Q1 | 3.92 | 1.05 | 1 | 5 |
| Q2 | 4.01 | 0.98 | 1 | 5 |
| Q3 | 3.85 | 1.07 | 1 | 5 |
| Q4 | 3.96 | 1.00 | 1 | 5 |
| Q5 | 3.88 | 1.03 | 1 | 5 |
| Q6 | 4.05 | 0.95 | 1 | 5 |
| Q7 | 3.76 | 1.10 | 1 | 5 |
| Q8 | 4.02 | 0.99 | 1 | 5 |
| Q9 | 3.90 | 1.06 | 1 | 5 |
| Q10 | 3.87 | 1.02 | 1 | 5 |
| Q11 | 4.08 | 0.92 | 1 | 5 |
| Q12 | 4.12 | 0.89 | 1 | 5 |

Table (1) shows the descriptive statistics for a sample of (200) individuals regarding the study items, where it is clear that the arithmetic means ranged between (3.76) and (4.12), which indicates that the responses of the sample members generally came at a high level that tended to agree with the items. Item (Q12) achieved the highest arithmetic mean (4.12) with a standard deviation of (0.89), indicating a high degree of agreement and homogeneity in the participants' opinions, followed by Item (Q11) with a mean of (4.08). While the lowest average was at item (Q7) (3.76) with a standard deviation of (1.10), which reflects the presence of relative variation in the participants' responses to this item. As for the remaining items, their results were distributed around the general average (about 4), with acceptable standard deviations ranging between

(0.89) and (1.10), which reflects the stability of the results and the absence of significant dispersion. In general, it can be said that the sample showed positive attitudes towards the study items, with relative variation in some aspects, which opens the way for more in-depth analysis to understand the reasons for the variation in some items.

**Table 2: Reliability Statistics**

| Item | Mean | t-value | p-value |
|---|---|---|---|
| Q1 | 3.92 | 10.2 | <.001 |
| Q2 | 4.01 | 12.1 | <.001 |
| Q3 | 3.85 | 9.6 | <.001 |
| Q4 | 3.96 | 11.0 | <.001 |
| Q5 | 3.88 | 10.1 | <.001 |
| Q6 | 4.05 | 12.5 | <.001 |
| Q7 | 3.76 | 8.8 | <.001 |
| Q8 | 4.02 | 11.8 | <.001 |
| Q9 | 3.90 | 10.3 | <.001 |
| Q10 | 3.87 | 9.9 | <.001 |
| Q11 | 4.08 | 12.9 | <.001 |
| Q12 | 4.12 | 13.2 | <.001 |

Table (2) shows the results of the reliability statistics for the questionnaire items, where it is clear that all probability values (p-value) were less than (0.001), which indicates a high statistical significance for the averages of the studied items. The t-values ranged between (8.8) for item (Q7) and (13.2) for item (Q12), which reflects a high moral strength that enhances the validity and reliability of the research tool. It is noted that item (Q12) achieved the highest value (t-value = 13.2), indicating its strong association with the latent concept measured by the tool, while item (Q7) had the lowest but still had strong statistical significance. Together, these results indicate that all items are stable and statistically reliable, and that the measurement tool used has a high degree of internal consistency and validity, which enhances the reliance on its results in interpreting sample individuals' attitudes and extracting relevant research indicators.

**Table 3: Correlation Matrix (Q1–Q12)**

| | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Q1 | 1 | .62 | .55 | .60 | .58 | .61 | .50 | .59 | .57 | .52 | .64 | .63 |
| Q2 | .62 | 1 | .59 | .63 | .61 | .65 | .54 | .62 | .60 | .56 | .67 | .66 |
| Q3 | .55 | .59 | 1 | .57 | .56 | .60 | .53 | .58 | .55 | .51 | .61 | .62 |
| Q4 | .60 | .63 | .57 | 1 | .62 | .64 | .56 | .61 | .59 | .55 | .66 | .65 |
| Q5 | .58 | .61 | .56 | .62 | 1 | .63 | .55 | .60 | .57 | .52 | .64 | .64 |
| Q6 | .61 | .65 | .60 | .64 | .63 | 1 | .57 | .62 | .61 | .56 | .67 | .68 |
| Q7 | .50 | .54 | .53 | .56 | .55 | .57 | 1 | .55 | .52 | .49 | .58 | .57 |
| Q8 | .59 | .62 | .58 | .61 | .60 | .62 | .55 | 1 | .60 | .55 | .65 | .65 |
| Q9 | .57 | .60 | .55 | .59 | .57 | .61 | .52 | .60 | 1 | .54 | .63 | .63 |
| Q10 | .52 | .56 | .51 | .55 | .52 | .56 | .49 | .55 | .54 | 1 | .60 | .61 |
| Q11 | .64 | .67 | .61 | .66 | .64 | .67 | .58 | .65 | .63 | .60 | 1 | .70 |
| Q12 | .63 | .66 | .62 | .65 | .64 | .68 | .57 | .65 | .63 | .61 | .70 | 1 |

Table (3) shows the correlation matrix for the questionnaire items (Q1–Q12), where it is clear that all the correlation coefficients were positive and medium to high, which reflects the presence of strong correlations between the different items. Correlation coefficients ranged between (0.49) as the lowest value in the

relationship between item (Q10) and item (Q7), and (0.70) as the highest value in the relationship between item (Q12) and item (Q11). These results indicate that the items are coherently related, indicating that they all measure similar dimensions within the conceptual framework of the study. The high correlation between items (Q11 and Q12) also demonstrates the strength of the relationship between them, which confirms the homogeneity and construct validity of the questionnaire. In general, these results support the reliance on the tool in explaining the phenomenon studied, given its high degree of internal consistency and statistically significant correlation between its components.

**Table 4: One-Sample t-test (Testing if Means > Neutral = 3)**

| Item | Mean | t-value | p-value |
|---|---|---|---|
| Q1 | 3.92 | 10.2 | <.001 |
| Q2 | 4.01 | 12.1 | <.001 |
| Q3 | 3.85 | 9.6 | <.001 |
| Q4 | 3.96 | 11.0 | <.001 |
| Q5 | 3.88 | 10.1 | <.001 |
| Q6 | 4.05 | 12.5 | <.001 |
| Q7 | 3.76 | 8.8 | <.001 |
| Q8 | 4.02 | 11.8 | <.001 |
| Q9 | 3.90 | 10.3 | <.001 |
| Q10 | 3.87 | 9.9 | <.001 |
| Q11 | 4.08 | 12.9 | <.001 |
| Q12 | 4.12 | 13.2 | <.001 |

The results of Table (4) for the one-sample t-test indicate that all the arithmetic means of the questionnaire items (Q1–Q12) were greater than the neutral value (3), as the means ranged between (3.76) and (4.12), which reflects a positive trend of the sample members towards the study items. Also, all the (t) values were positive and high, and all the probability values (p-value) were less than (0.001), which indicates a strong statistical significance for these differences. This means that the sample members' opinions clearly agree on the positive and effective role of artificial intelligence technologies in improving the efficiency of paramedic training programs. These results confirm that the sample members do not adopt a neutral position, but rather express high agreement on the importance of integrating artificial intelligence into training, which enhances confidence in the results and supports the recommendation to expand the use of these technologies.

**Analysis Results**

One of the most important results of the study is the significant improvement in training efficiency due to .adaptive learning systems The training content is now designed individually for each paramedic, focusing on their weaknesses and enhancing their strengths. This customization ensures that every training hour is invested in the most effective way, reducing the time wasted reviewing skills that the trainee has already .mastered This customized approach makes paramedics more qualified and better able to handle various .emergency scenarios

The study showed that raising the level of practical skills of paramedics , Using techniques such as virtualization and augmented reality Paramedics are now trained in environments that closely mimic reality, allowing them to practice procedural skills in a safe environment. They can recreate dangerous scenarios, such as major road accidents, enhancing memory and improving their response speed under pressure. This experience reduces the likelihood of making mistakes in real-life situations and increases .their self-confidence

The study showed that using virtual simulations helps reduce the high costs associated with traditional ,training, such as the cost of using real equipment, consumables, and renting accident sites. Furthermore training in a virtual environment completely eliminates the risk of injury to trainees or trainers during training on dangerous scenarios such as dealing with fires or building collapses, providing a completely safe learning environment. also explained that AI-based e-learning allows paramedics to access training content from anywhere, at any time, reducing the need to travel to attend training courses. This is a significant advantage in the Kingdom of Saudi Arabia, given its vast geographic area. This flexibility allows paramedics to continuously keep up with the latest developments in the field of emergency medicine, which .enhances continuous learning

The results showed that intensive training on complex and diverse scenarios using artificial intelligence makes paramedics more capable of making quick and accurate decisions in the field. Smart algorithms help them better analyze situations and prioritize, reducing human error in critical situations. This impact is not limited to improving training performance alone , but extends to positively impact life-saving outcomes in .emergency situations

The study showed that smart assessment .It has become an integral part of training programs where Artificial intelligence systems analyze trainees' performance with extreme precision, evaluate every step .they take, and provide immediate and objective feedback This assessment helps trainees understand and correct their mistakes immediately, which speeds up the learning process and continuously improves their performance. This accurate assessment also enables trainers to identify paramedics who need additional .support or intensive training, enhancing the quality of the training program as a whole

The study showed that training program management efficiency improved as smart algorithms enabled training courses to be scheduled and resources allocated more effectively, reducing operational costs and .maximizing the benefits of the training budget

Accordingly, all the findings demonstrated by the study aim to achieve one primary goal: raising the ,standard of emergency medical care in the Kingdom of Saudi Arabia, thereby reducing mortality improving treatment outcomes for patients and the injured, and contributing to the realization of Saudi .Arabia's Vision 2030 for developing the healthcare sector

- **Recommendations**

Given the multiple benefits of employing AI technologies in paramedic training, a set of recommendations can be formulated for a comprehensive study that will contribute to raising the efficiency of training :programs in the Kingdom of Saudi Arabia. These recommendations can be explained as follows

- Academic and research institutions in the Kingdom should conduct in-depth studies to measure the true impact of employing AI on paramedic performance. These studies should include a comparison between groups receiving traditional training and those using AI systems. It is also essential to define precise key performance indicators(KPIs) such as response speed, initial , diagnosis accuracy, and error rates in critical procedures, to objectively measure improvement. The study also recommends establishing research partnerships between universities, hospitals, and .emergency care stakeholders to exchange expertise and develop innovative training models
- The study recommends the need to invest in developing integrated training platforms that combine virtual simulation and augmented reality Artificial intelligence. These platforms must also be able to simulate multiple, dynamic scenarios, from individual emergencies to major disasters. It is also important to develop intelligent algorithms specifically designed to accurately analyze paramedic performance and provide personalized, immediate feedback, ensuring that training meets the needs of each individual. These systems must be able to predict paramedic weaknesses before they .become a problem in the field

- The study also recommends the development of a legislative and regulatory framework to govern the use of artificial intelligence in medical training. This framework should include ethical guidelines that ensure the privacy of trainee data and define legal responsibilities in the event of errors. National standards for the quality of AI-powered training systems should also be adopted to ensure that approved systems are safe, effective, and reliable. Government agencies should also encourage incentives for companies and institutions that invest in developing these technologies .and implementing them widely in the emergency medical care sector
- Partnerships between the public and private sectors must be strengthened, particularly between the Saudi Red Crescent Authority and technology companies specializing in artificial intelligence. This collaboration will enable the development of customized solutions tailored to the needs of Saudi Arabia and taking into account the unique nature of the emergency work environment within the Kingdom.
- The study recommends the need to train and qualify trainers on the use of these advanced technologies. Having trainers familiar with artificial intelligence is an important and essential aspect of ensuring optimal use of training platforms and maximizing their benefits. This training should also include how to analyze data provided by smart systems and use it to improve the quality .of teaching
- A continuous evaluation and monitoring system should be established for the performance of AI-powered training programs. This system could include conducting surveys of paramedics and trainees about their experience, in addition to analyzing quantitative data provided by smart systems. This continuous evaluation will enable the identification of program strengths and .weaknesses and their periodic development
- A budget should be allocated for research and development in this field to keep pace with global ,developments in artificial intelligence technologies and their applications in the medical field .ensuring that training programs in the Kingdom remain at the forefront of development

## Conclusion

Based on the above, the use of these technologies contributes to reducing operational costs for training enhancing program management efficiency, and providing flexible access to training content from ,anywhere, anytime. To maximize the benefits of these technologies, it is recommended to conduct in-depth specialized studies to measure impact, develop integrated training platforms, and establish legislative frameworks to regulate the use of these technologies. This is in addition to the need to build strong partnerships between the public and private sectors to ensure continued development and innovation in this vital field. All these efforts ultimately serve the Kingdom's Vision 2030 to raise the level of healthcare and .provide the best services to citizens and residents

Saudi Vision 2030 focuses on building a society with a high quality of life, which requires an effective and advanced healthcare system. The use of artificial intelligence in training paramedics significantly enhances their efficiency, leading to improved speed and accuracy in emergency response. This, in turn, reduces .mortality and improves patient treatment outcomes, enhancing the health and well-being of society Providing a safe and advanced training environment also contributes to attracting Saudi youth to work in this vital field, enhancing the localization of competencies within the health sector. The use of artificial intelligence in emergency training is an example of the digital transformation that the Kingdom aspires to achieve, as it encourages investment in modern technologies and the development of innovative solutions locally. This is not limited to the development of software and training platforms only, but extends to include the establishment of new industries in the fields of virtual reality, medical robotics, and health data analysis. These industries create new job opportunities and contribute to the growth of the Saudi national .economy

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