

An intelligent tutoring system for health problems related to addiction of video game playing

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Abstract

Lately in the past couple of years, there are an increasing in the normal rate of playing computer games or video games compared to the E-learning content that are introduced for the safety of our children, and the impact of the video game addictiveness that ranges from (Musculoskeletal issues, Vision problems and Obesity). Furthermore, this paper introduce an intelligent tutoring system for both parent and their children for enhancement the experience of gaming and tell us about the health problems and how we can solve them, with an easy user interface that way can our children be happy and excited about the information and their health.

Keywords: tutoring system; e-learning; expert systems; video games; health; video game addiction

1. Introduction

A lot of different views of the video gaming industry arguments about how that industry is responsible about the majority of our children problems in there societal, scientific and healthcare and their negative behaviors and attitudes in the normal life [3].

In spite of starter of games development industry from the 1980s, different researches confirmed the negative effects that link addiction of video games, violence, aggression and other issues that appeared especially for specific video game genres [4] even if used as an educational tool in the schools.



Fig 1: Video game addiction

After gathering data from more than 4,000 households and surveyed their opinion about the video game playing of his children [5]; The Entertainment Software Association (ESA) published on 2016 about the Computer and Video Game Industry; and inference that every house contain at least one person who play games for at least 3 hours/week with average of 13 years from his life. About half of this is female (48%), with high percent of 21% of the total ages of 18 or younger, and a majority of parents (91%) say it must be present on purchasing video games and want to check Entertainment

Software Rating Board (ESRB) [17] before letting their child to play the game.

In spite of this result, we introduce our intelligent tutoring system to help raid of the most problems of extra time games playing like Musculoskeletal [18], Vision problems [19] and the increase BMI for our children over the time spent on playing games [20].

2. Intelligent Tutoring Systems (ITS)

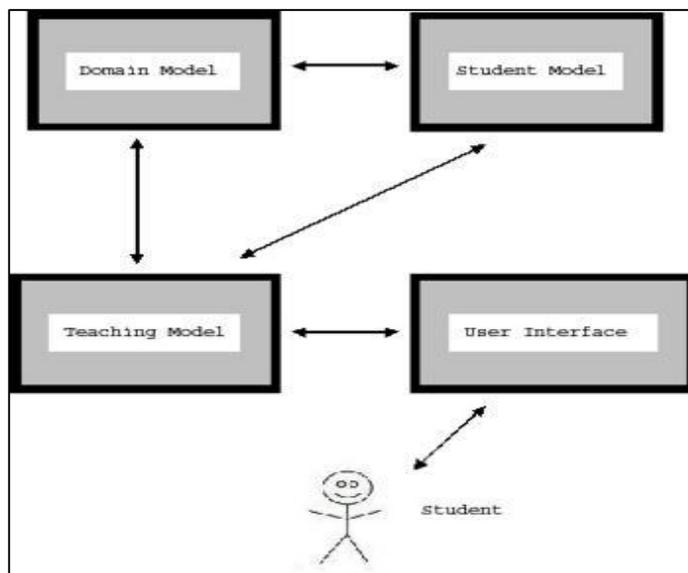


Fig 2: Component of the ITS systems

Intelligent Tutoring Systems is using computer system to provide E-Learning content to the user without the need of expert teacher like class in any traditional school or university. This programs allow using and provide enhance experience to the learner and immediate feedback to them on organizational way like the expert teacher [6-14, 21-38] see figure 2 for details. ITS have four essential components:

- **Domain model:** the lessons that present the learning content to the learner.

- **Student model:** the student like experience and data on our system.
- **Teaching model:** this software like teacher model that matches the learner experience with the knowledge base to reach appropriate feedback and related score. This are accomplished using the Knowledge tracing unit.
- **User Interface model:** represent the both component of student and the teacher UI for using the tutor.

3. Authoring System

A program that help in creating more than ITS with relatively easy way and provide the experience of crating ITS without the need of expert programmer to made it.

Our Intelligent Tutoring System was implemented using used ITSB authoring tool that are stands for Intelligent Tutoring System Builder [1]. It is a two language supported system (English and Arabic) and easy to manage throw their student UI and the Teacher UI screens. The ITSB implemented in Delphi Embarcadero RAD Studio XE8 [2]. ITSB is easy for the domain expert to build the ITS system and for the end users when they use it, without any requirement of programming of use.

4. Literature Review

Many of ITS systems published over the couples of years [6-14,21-37], ranging from learning programming languages (C++, java), the Spoken language (Arabic, English), Mathematical equations or operations, and the addition of this system is mainly increasing over the past years; but there is no specialized tutoring system for teaching games health problems.

A recent ITS is called COMET [15] that are used for medical problem-based learning; Another one is for Mentoring Diabetes [16]; The Major of these ITS are specialized in one specific disease and other in a few diseases. However, the current proposed ITS system is specialized in the video games playing health problem.

5. Materials and Content

The proposed IT'S provide a leaning content about the video games playing health problem for:

- a) **Musculoskeletal issues:** ranging from pain in the hands, wrists and the thumb of the controller that used on the rapid gaming experience of the players [18].
 - **Video Game Benefits:** A proposed solution to the problem to tell children to play slowly.
- b) **Vision problems:** ranging from eyestrain on cornea to the iris that can lead to headaches, dizziness, and evens chances of vomiting from focusing on a screen [19].
 - **Protecting Your Vision:** A proposed solution to the problem.
- c) **Obesity problems:** ranging from the extra weight to the BMI change in faster way over the game playing time [20].
 - **To combat weight problems, get the whole family involved:** A proposed solution to the problem.

After the learner finish, each chapter he can proceeds to the questions that are ranging from asking questions that requires Yes/No answers to a physical content (Videos and Images) of players that play on some specific scenario and give the user the ability to choose the correct symptoms based on the info that are given. The proposed ITS will ask the user to choose the correct answer in each question window. At the end of the chapter session, there is a proposed recommendation for each symptoms that can happen to the users. Figure 3 shows the first screen of the ITS session. Figure 4 shows an example of lessons on the main teacher screen. Figure 5 shows question window that we can add, remove or modify them. Figure 6 shows the main user window with lesson selected. Figure 7 shows user window with example to the lesson selected. Figure 8 shows user question main window. Figure 9 shows question with the check result option. Figure 10 shows question window with hint added to the question. Figure 11 shows feedback to the user to re-study specific lesson after failing on questions. Figure 12 feedback to the user after complete specific lesson with his score. In addition, Figure 13 shows tutor status for all students with the ability to see his current score, difficulty and his overall section.

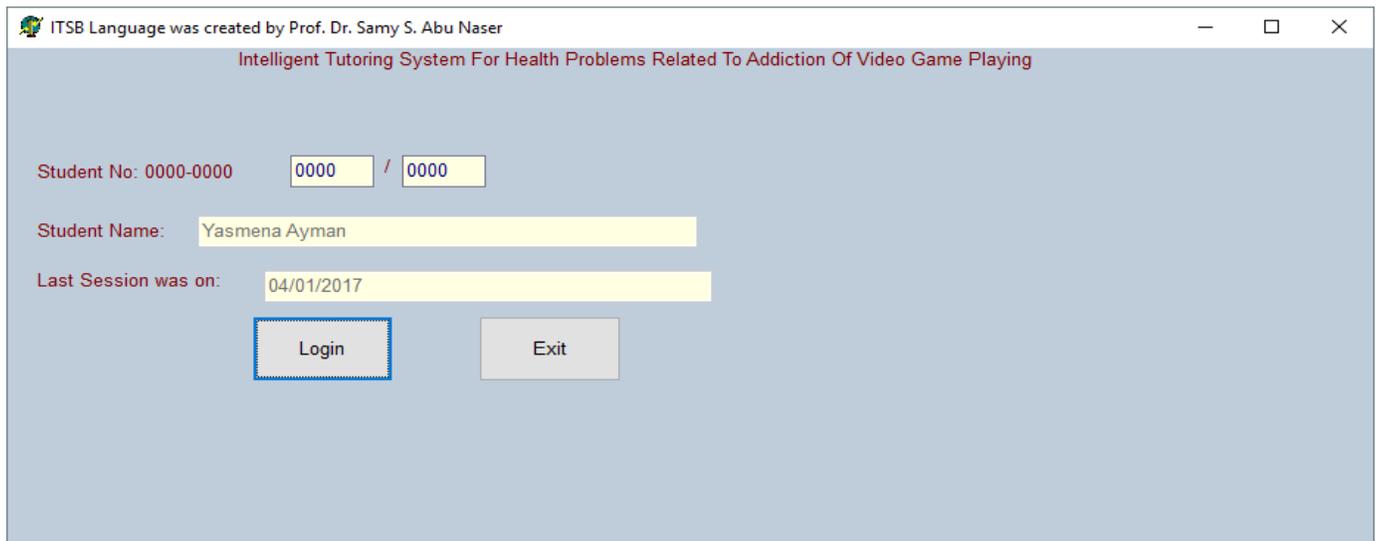


Fig 3: Shows start screen of the ITS system session

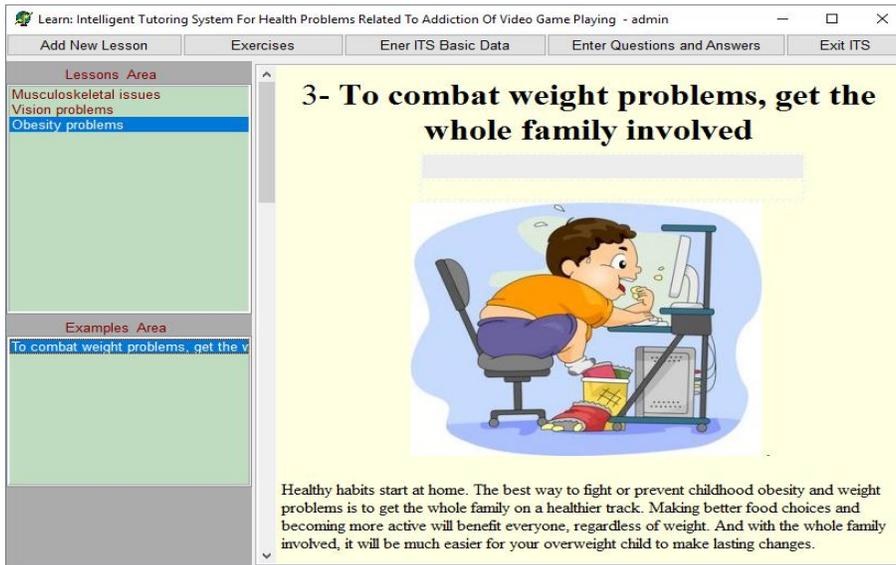


Fig 4: Shows ITS main teacher screen with its options

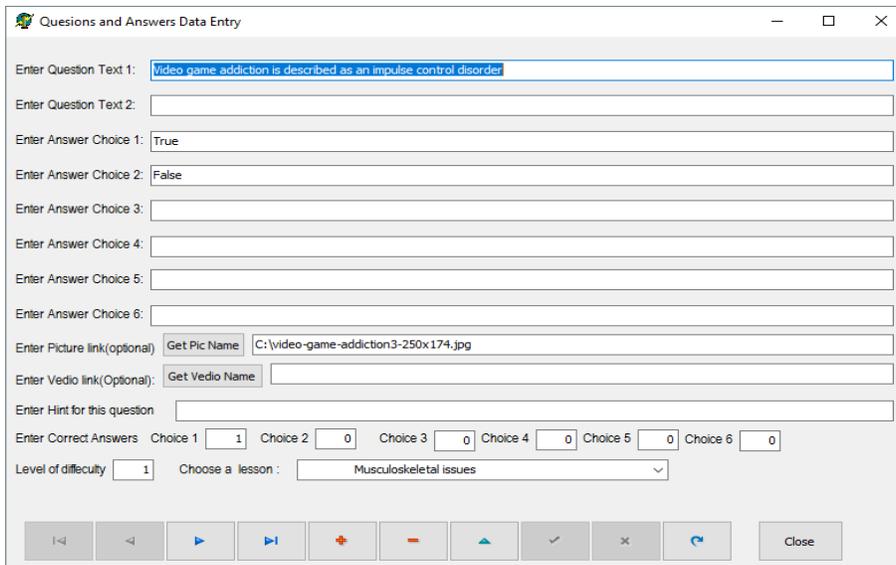


Fig 5: Shows ITS main questions screen

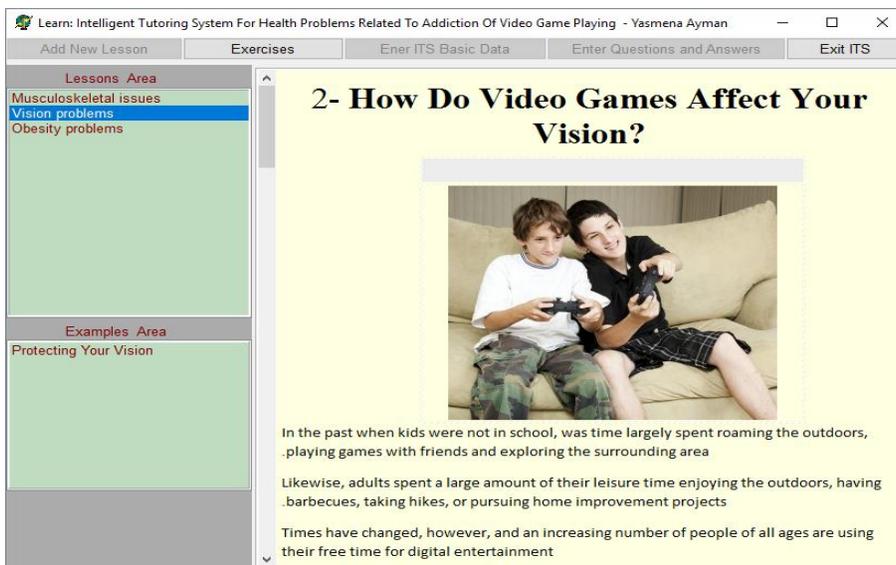


Fig 6: Shows ITS main user screen with lesson selected

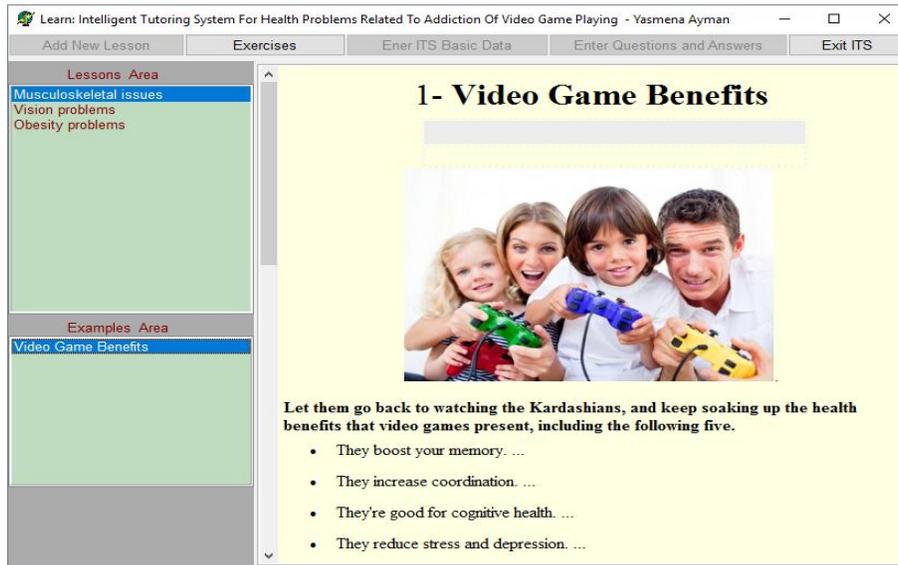


Fig 7: Shows ITS main user screen with example selected

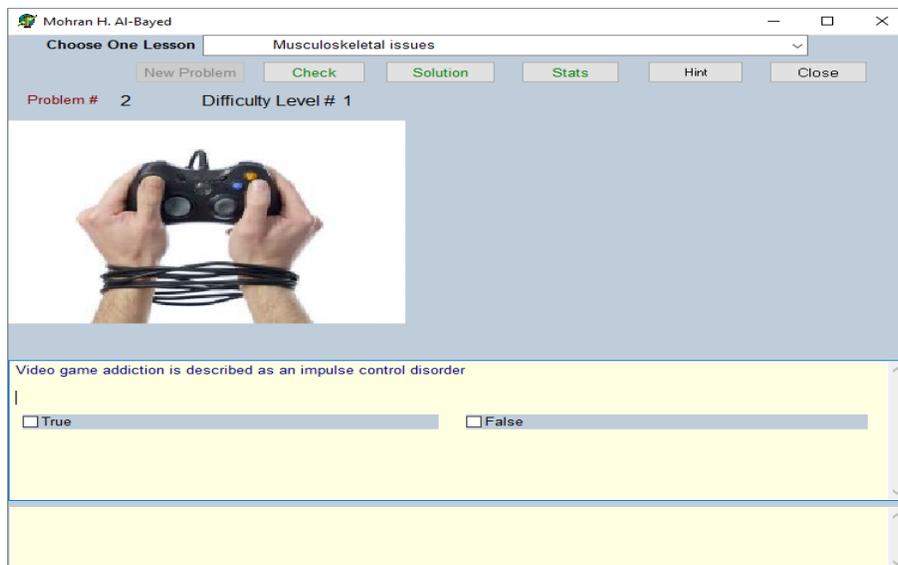


Fig 8: Shows ITS main questions screen within lessons

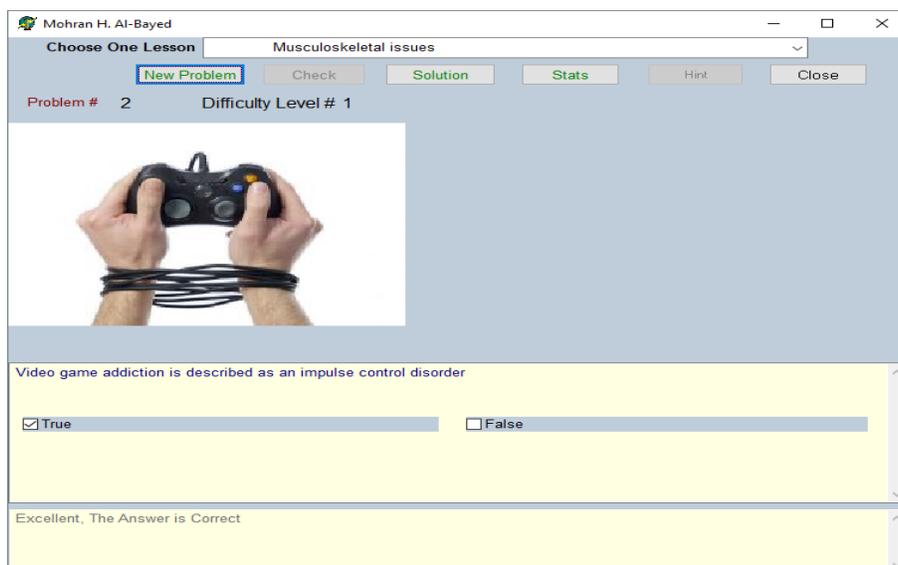


Fig 9: Shows ITS questions check answer



Fig 10: Shows ITS questions with a hint

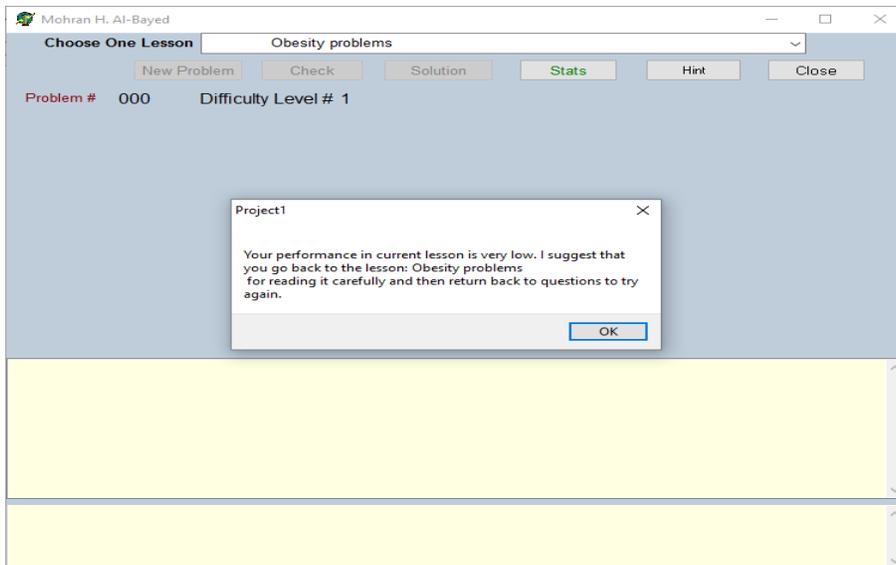


Fig 11: Shows ITS feedback to user to re-study specific lesson

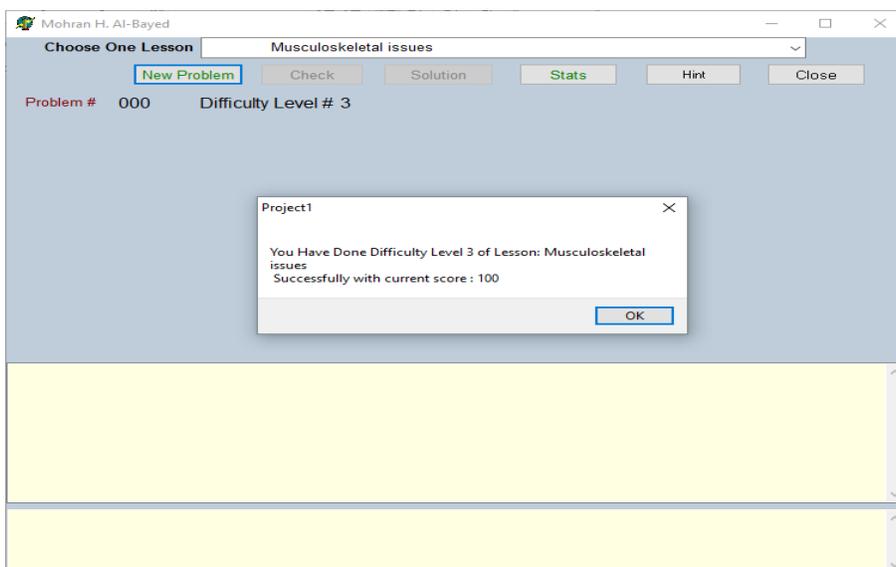


Fig 12: Shows ITS feedback to user after complete specific lesson with its questions

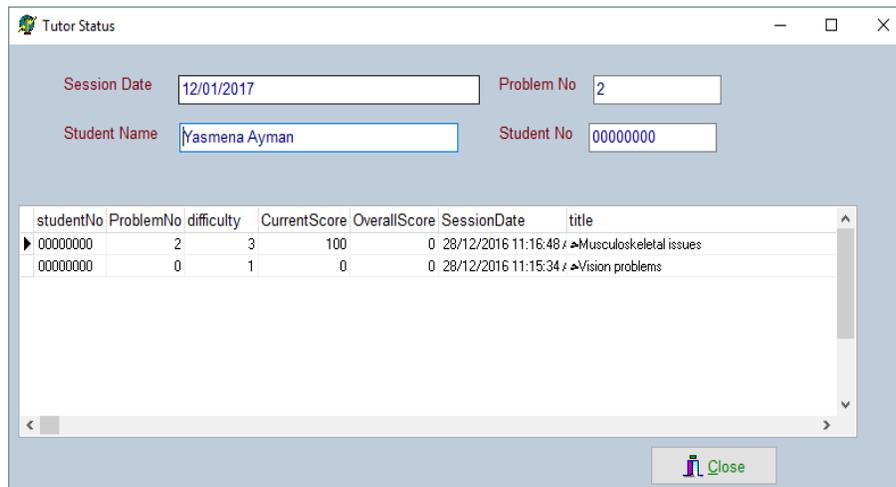


Fig 13: Shows ITS main status for student

6. Conclusion

In this paper, intelligent tutoring system solution developed for aiding learner to diagnosing patients with possible Games Health Problems. This ITS does not require extra training to be used; it has a straightforward and user-friendly interface with support of videos and images to enhance the experience of any user can use it. It was developed using ITSB authoring tool. Moreover, the results of the preliminary testing of this system showed potential and notifiable enhancement to the user level of learning based on its content.

7. Future Work

This IT'S considered the first released of our system; more aureate synonyms will be handled and treated to be added in an easy way to learn for more users from anywhere at any time. In addition, more questions will be added and more question scenarios for aiding the content will generated.

8. References

- Naser SSA. ITSB: An Intelligent Tutoring System Authoring Tool. *Journal of Scientific and Engineering Research*. 2016; 3(5):63-71.
- <https://www.embarcadero.com/products/rad-studio> Accessed 12 January, 2017.
- Naser SSA, Al-Bayed MH. Detecting Health Problems Related to Addiction of Video Game Playing Using an Expert System. *World Wide Journal of Multidisciplinary Research and Development*. 2016; 2(9):7-12.
- Freedman J. Media violence and its effect on aggression: assessing the scientific evidence, 2002. ISBN 0802084257.
- <http://essentialfacts.theesa.com/> Accessed 12, 2017.
- Naser S. evaluating the effectiveness of the CPP-Tutor an intelligent tutoring system for students learning to program in C++. *Journal of Applied Sciences Research*; www.aensiweb.com/JASR/. 2009; 5(1):109-114.
- Naser SA. A comparative study between Animated Intelligent Tutoring Systems (AITS) and Video-based Intelligent Tutoring Systems (VITS). *Al-Aqsa University Journal*. 2001; 5(1):1.
- Naser SA. An Agent Based Intelligent Tutoring System For Parameter Passing In Java Programming. *Journal of Theoretical & Applied Information Technology*, 2008; 4(7).
- Naser SA, Ahmed A, Al-Masri N, Sultan YA. Human Computer Interaction Design of the LP-ITS: Linear Programming Intelligent Tutoring Systems. *International Journal of Artificial Intelligence & Applications (IJAIA)*. 2011; 2(3):60-70.
- Naser SSA. Intelligent tutoring system for teaching database to sophomore students in Gaza and its effect on their performance. *Information Technology Journal*; Scialert, 2006; 5(5):916-922.
- Naser SSA. Developing an intelligent tutoring system for students learning to program in C++. *Information Technology Journal Scialert*. 2008; 7(7):1055-1060.
- Naser SSA. A Qualitative Study of LP-ITS: Linear Programming Intelligent Tutoring System. *International Journal of Computer Science & Information Technology*, 2012; 4(1):209-220.
- Naser SSA. Predicting learner's performance using artificial neural networks in linear programming intelligent tutoring system. *International Journal of Artificial Intelligence & Applications*. 2012; 3(2):65-73.
- Naser SSA, Sulisel O. The effect of using computer aided instruction on performance of 10th grade biology in Gaza. *Journal of the College of Education*. 2000; 4:9-37.
- Peter Haddawy, Siriwan Suebnukarn. COMET: A Collaborative Tutoring System for Medical Problem-Based Learning, *IEEE Intelligent Systems*, 2007; 22:70-77. July/August 2007, doi:10.1109/MIS.2007.66
- Gujarathi MV, Sonawane MS. Intelligent Tutoring System: A case study of mobile entering for diabetes-IJAIS, 2012; 3(8):41-43.
- www.esrb.org/ Accessed 12, 2017.
- Safura Abdool Karim. Playstation thumb-a new epidemic in children. *S. Afr. Med. J.* 2005; 95(6).
- Gillespie RM. The physical impact of computers and electronic game use on children and adolescents, a review of current literature. 2002; 18(3).
- Rehbein F, Kleimann M, Mössle T. Prevalence and risk factors of video game dependency in adolescence: results of a German nationwide survey. 2010; 12(3).
- Abu Naser S. JEE-Tutor: An Intelligent Tutoring System for Java Expression Evaluation, *Information Technology Journal*, Scialert, 2008; 7(3):528-532.

22. Abu-Naser S, Ahmed A, Al-Masri N, Deeb A, Moshtaha E, AbuLamdy M. An Intelligent Tutoring System for Learning Java Objects. *International Journal of Artificial Intelligence and Applications (IJAIA)*, 2011; 2(2).
23. Abu-Naser S, Al-Masri A, Sultan YA, Zaqout I. A prototype decision support system for optimizing the effectiveness of elearning in educational institutions. *International Journal of Data Mining & Knowledge Management Process (IJDMP)*, 2011; 1:1-13.
24. Akkila AN, Naser SSA. Teaching the Right Letter Pronunciation in Reciting the Holy Quran Using Intelligent Tutoring System. *International Journal of Advanced Research and Development*. 2017; 2(1).
25. Al-Bastami BH, Naser SSA. Design and Development of an Intelligent Tutoring System for C# Language, *European Academic Research*. 2017; 4(10).
26. ALDahdooh R, Naser SSA. Development and Evaluation of the Oracle Intelligent Tutoring System (OITS), *European Academic Research*. 2017; 4(10).
27. Alhabbash MI, Mahdi AO, Abu Naser SS. An Intelligent Tutoring System for Teaching Grammar English Tenses. *European Advanced Research*, 2016; 4(9):7743-7757.
28. Al-Hanjori MM, Shaath MZ, Naser SSA. Learning Computer Networks Using Intelligent Tutoring System. *International Journal of Advanced Research and Development*. 2017; 2(1).
29. Almurshidi SH, Naser SSA. Design and Development of Diabetes Intelligent Tutoring System. *European Academic Research*. 2017; 4(9):8117-8128.
30. Almurshidi SH, Naser SSA. Stomach Disease Intelligent Tutoring System. *International Journal of Advanced Research and Development*. 2017; 2(1).
31. Al-Nakhhal MA, Naser SSA. An Intelligent Tutoring System for learning Computer Theory, *European Academic Research*, 2017; 4(10).
32. El Haddad IA, Naser SSA. ADO-Tutor: Intelligent Tutoring System for leaning ADO.NET. *European Academic Research*. 2017; 4(10).
33. Hamed MA, Naser SSA. An Intelligent Tutoring System for Teaching the 7 Characteristics for Living Things. *International Journal of Advanced Research and Development*. 2017; 2(1).
34. Hilles MM, Naser SSA. Knowledge-based Intelligent Tutoring System for Teaching Mongo Database. *European Academic Research*, 2017; 4(10).
35. Mahdi AO, Alhabbash MI, Naser SSA. An intelligent tutoring system for teaching advanced topics in information security. *World Wide Journal of Multidisciplinary Research and Development*. 2016; 2(12):1-9.
36. Naser SSA. Developing visualization tool for teaching AI searching algorithms, *Information Technology Journal Scialert*. 2008; 7(2):350-355.
37. Elnajjar AA, Naser SSA. DSE-Tutor: An Intelligent Tutoring System for Teaching DES Information Security Algorithm. *International Journal of Advanced Research and Development*. 2017; 2(1).
38. Mahmoud AY, Barakat MS, Ajjour MJ. Design and Development of Elearning University System. (*Journal of Multidisciplinary Engineering Science Studies (JMESS)*). 2016; 2(5):498-504.