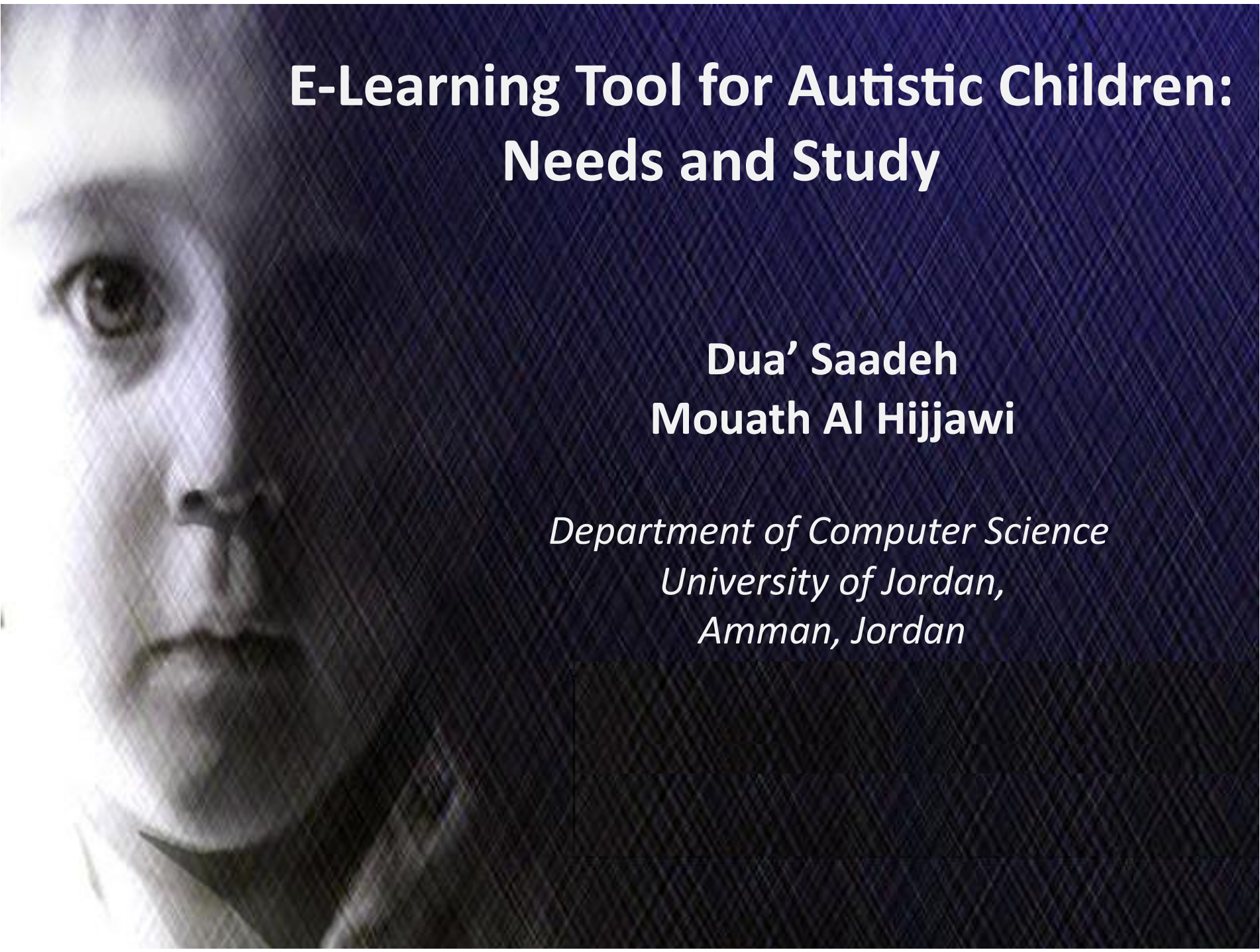




E-Learning Tool for Autistic Children: Needs and Study

**Dua' Saadeh
Mouath Al Hijjawi**

*Department of Computer Science
University of Jordan,
Amman, Jordan*

- **Abstract**

Many traditional and modern techniques are used in autism therapy, and hence E-learning is becoming an important tool to support the learning system to achieve its goals within learning process

The paper introduces an e-learning project that aims to teach autistic children of different ages some fundamental information, by taking into account the typical mental absorption of autistic children. Using this e-learning tool will be less costly and will help the parents to teach their autistic children at home.

- **Autism disorder**

Autism is a neurodevelopment disorder produced by alterations in the brain functionality which acts as developmental retardants during the first three years of the children life .The main causes of autism are still not clear.

Autism disorder symptoms

- a tendency to isolation and lack of social interaction
- Apathy
- the establishment of a personal daily routine
- an abnormal relation with toys and other objects

Related works

Most applications and studies used in Autism therapy focus on :

- the study of the abilities of autistic children to interact with their external environment
- the study of their capacity to express their feelings and impressions

Examples: simulated real scenarios, such as a birthday party

Applications try to teach autistic children about people interactions, by collecting images for people in different feeling situations (sad, happy, angry)



Sad



Angry



Happy



Fear



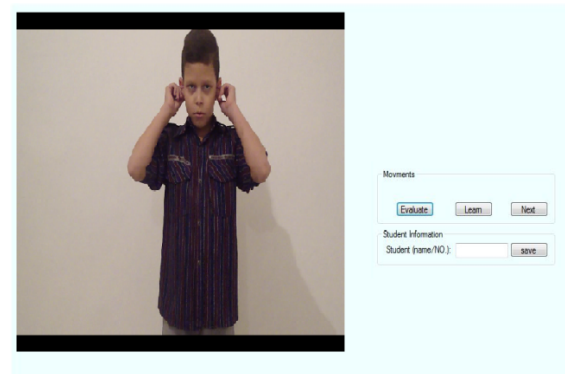
Disgusted



Surprised

Designed Applications

- In order to design our e-learning application, a study has been made on the psychological aspects of autistic children, their characteristics and their ability to understand information



The project was tested at the **Autism Academy of Jordan** with the supervision of specialists and therapists. Some issues taken into consideration were:

- Autistic children suffer from a high level of distraction.
- Autistic children tend to be isolated and have poor interaction with people. This may cause difficulties which could affect the educational process.
- They have good abilities to deal with computers and material objects.
- Engage as many senses as possible

i.e. pictures and sounds should be used at the same time.

Application 1

- The main goal of this application is to teach autistic children pet pictures, names and sounds. According to the advice of specialists, the application was designed to comply with the following features



Application 1 Demo



Application 1 Demo



Results

it was tested in **Autism Academy of Jordan** along three weeks; three hours per a day on **43 children** with different disability levels and ages, **40 boys and 3 girls** with age range between **7 and 14 years old**

- The children were divided into three groups, based on their communication skills and attention levels:
- Group1: A very good level group (22 children).
- Group2: A good group (11 children).
- Group3: An acceptable group (10 children).

Results table

	Group 1	Group 2	Group 3
Attention	Very good 86%	Good 73%	Poor 7%
Benefits	Good 67%	52%	
Distraction	Low level of distraction caused by the testing environment	High level of distraction 72% “the kids were hyper active, and some external factors”	Very High level of distraction 97% “low realization and poor abilities to interact with the external environment”

Application 2

This application focuses on teaching the Autistic children some basic body movements such as to stand up, set down and touch the ears .to make sure that the Autistic child will learn the movements correctly and efficiently the application will:



Movments

[Evaluate](#) [Learn](#) [Next](#)

Student Information

Student (name/NO.): [save](#)

Application English Interface



A video of a child performing the action
“Move your hands away from the body”
(Learning step)

Watch the
movie



Autistic kid

Perform the
requested action



Detect the movement
(evaluation step)

the results will
be saved in the
Childs' record

results

- This application was tested on eleven autistic children; ten boys and one girl. Those children have different disorder levels

The number of movements that done by the children; comparing with all showed movements gave the ratio 68 %.

The first impression may consider that this value is not high, but there are some factors behind giving this ratio:

- Some children have poor communication skills because of having a high level of autism disorder.
- Some distraction factors in the environment was attracting the attention of the children, making them not to interact with the system properly. These factors conclude some furniture pieces, toys and the attractive lights



Environment with distractions



Environment with no distractions

conclusion

E-learning is becoming an important tool to support the learning system to achieve its goals within the learning process. So in this paper and based on a study of the autism disorder, its symptoms, causes and therapy techniques, two e-learning applications have been designed and tested at the Autism Academy of Jordan, having been applied to an average of 40 students for 21 days. The children were divided into 3 groups, based on their communication skills and attention levels. And the results discussed in this paper have shown a clear improvement in their responses and interaction levels.

Thank you

