



# Designing Electronic Didactic - Based A Gamification Environment to Develop Skills of Electrical Engineering

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## Abstract

The Current Research Aims At Designing A Gamification - Based Electronic Didactic Environment In Order To Develop Skills of Electrical Engineering For Students Of Industrial Education Besides Outlining The Impact of The Electronic Environment on Developing The Above Mentioned Skills Because of The Low Level of Those Students Regarding Their Skillful And Cognitive Aspects. To Achieve The Research Aim, The Researcher Depended on The Developmental Method, And Designed An Accumulative Test And A Note Card. After The Experimental Application, It Was Clear That There Are Differences With Statistical Differences Between The Pre And Post Application At The Benefit of The Post One With Respect To The Cognitive Attainment And Skillful Aspect of The Electrical Engineering.

**Keywords:** *Gamification, Electronic Environment, Electrical Engineering Skills, Industrial Education*

## Introduction

Electronic Learning Environment As An Environment Which Is Based on Computer or Networks Which Facilitates Learning And Interaction Between The Learner And Different Electronic Sources. It Includes A Supplementary Collection Of Tools And Technologies Which Work on Delivering The Educational Content And Helping To Control Learning And Teaching Process Synchronously In A Particular Context To Achieve The Educational Aims [1]. The Electronic Environment Is Described By Flexibility, Suitability And Taking Care Of Individual Differences of Learners In Addition To Paving The Road For Learners To Choose The Suitable Control Level Which Fits Their Abilities [2]. Electronic Environment Faces Some Obstacles Such As Frustration, Bored Some And Lack In Motivation. Whereas [3] Sees That The Reason For The Previous Obstacles Is That The Learner Feels A Gap Between What He Wants To Achieve And What He Is Able To Do ; The Feeling Which Leads To Dropping Out Of Schools .Thus , Gamification Is By No Means The Best Solution [4].

## Definition

Gamification As one of The Technological Requirements Which Encourage To Use Games Inside Learning Environments [5] The Thing Which Increases Learners' Focus on Their Studying Tasks Without Feeling Frustration Bored Some , Worry or Excessive Excitement . Rather Gamification Serves Chances For Learners To Involve And Participate In School Activities And Homework[6] , Gamification As One Of The Educational Designs Which Contributes To Achieve Aims Via Applying Game Elements In Other Contexts [7]. Argue That Gamification Has Certain Aims And Rules And Is Described By Challenge, Cooperation, Winning , Loss, Feedback And It Is Possible To Be Repeated To Reach Success Again And Again Since It Has Game Elements Such As Points , Awards And Virtual Prizes . Sees That Gamification Tries To Improve Memory And Achieve Higher Levels In Academic Study. 'S Study Proves That Gamification Helps to Increase School Attainment and Reinforcing Learners' Abilities to Create and Use Logic in Solving Problems [8].

## Skills of Electrical Engineering

Electrical Engineering Is Considered One Of The Basic Subjects In Electricity And Electronics Department At Industrial Schools Since It Contains A Number Of Electrical Laws Theories And Concepts Which Are Tested

In Laps Besides Various Skills Learners Do At Workshops At Electrical Schools. To Add Many Studies Tackled With The Different Styles And Strategies Of Teaching Electrical Engineering [9].

## Methodology

The Research Depended on Answering The Following Questions To Verify The Suggested Hypotheses:

- 1- What Degree of Developing Cognitive Attainment And Its Impact on Skills of Electrical Engineering for Industrial Education Students?
- 2- What Degree of Developing Practical Skills And Its Impact on Skills of Electrical Engineering For Industrial Education Students?

### Research hypotheses:

- First Hypotheses: There Are Differences With Statistical Differences At Significant Level of (0.05) Between Means of Pre And Post Application Grades In The Cognitive Attainment For Developing Electrical Engineering Skills Of The Experimental Group At The Favor of The Post Application.
- Second Hypotheses: There Are Differences With Statistical Differences At Significant Level of (0.05) Between Means of Pre And Post Application Grades In The Note Card For Developing Electrical Engineering Skills of The Experimental Group At The Favor of The Post Application.

The Philosophy of Industrial Technical Education Is Based on Preparing Technicians Able To Cope With Work Market By Serving The Technical Skills Required For Electrical Engineering. After Holding Meetings With Students And Teachers Besides Doing Surveys, It Is Noticed That Student Have Little Awareness And Knowledge With Electrical Engineering. The Current Research Tries To Handle That Problem By Applying Gamification of A (30) Student Sample At Industrial Secondary Students Belonging To (Zefta School) For Industrial Education. Those Egyptian Girls Are Aged (15 - 16) Years. The Electronic Environment Included (Kahoot) Gamification Application Besides Using An Interesting Game Program of (Powtoon) And PowerPoint. The Electronic Content Was Divided Into Levels And Steps Leading To A Group of Game Motivations Such As Competitions, Games And Activities. Besides, (50) Clause-Accumulative Test Was Designed To Measure The Knowledge Aspect of The Electrical Engineering For Students Who Were Undergone (2) Groups of Questions: First Group Included 30 Multi-Choice Questions And The Second Group Was About (20) Yes / No Questions. To Complete The Research Procedures, A Note Card To Measure The Knowledge Aspect For Students Was Designed To Include (8) Main Skills And (98) Subsidiary Ones. To Evaluate Students' Performance, The Note Card Was Classified Into (5) Categories: Participated, Good, Average, Weak, And Not Participated. (Spss) Was Used To Analyses Results of Pre / Post Application.

## Results

After Applying the Accumulative Test on Students, Findings Showed Differences with Statistical Significance at Level (0.05) Between Means and Standard Deviations of Experimental Group Grades in The Pre / Post Application of The Knowledge Achievement Test as Shown In Table (1)

**Table (1) statistical significance of differences between means of performance grades in the accumulative test**

Group	Means	Standard Deviation	The Number	Degree of Freedom	T Value	Sig
Pre	5.03	2.2	30	29	131.9	0.05
Post	48.3	2.02				

The Previous Table Shows Difference between the Pre And Post Application of The Experimental Group At The Favor of The Post Application. It Is Noticed That Mean Of Pre Application Grades Was (5.03) Which Is Fewer Than The Mean of The Post Application Grades Which Was (48.3). The Difference Between Means Has A Statistical Significance Because Value of The Calculated "T" Was (131.9) Which Is More Than Table Value of "T"(0.05). After Applying Note Card on Students, Results Showed Differences with Statistical Significance at Level (0.05) Between Means And Standard Deviations of Experimental Group Grades In The Pre And Post Application For The Knowledge Aspect of Electrical Engineering Skills As Shown In Table (2)

**Table(2) of statistical significance for differences between means of performance grades in note card**

Group	Means	Standard Deviation	The Number	Degree of Freedom	T Value	Sig
Pre	26.6	2.79	30	29	417.61	0.05
Post	276.5	3.62				

## Discussion

The Previous Tables (2) Prove That There Is A Difference Between The Pre And Post Application For The Experimental Group. It Is Remarked That The Knowledge Aspect And The Note Card of The Skillful Performance Test Witnessed Increase In The Grade Means of The Post Application Than The Pre One; The Thing Which Confirms The Important Role Which The Gamification- Based Learning Environment Plays In Developing Practical And Cognitive Skills For Students Who Were Greatly Influenced By The Electrical Engineering Skills. These Results Met With The Previous Studies In That Field.

## Conclusion

Gamification Is Considered An Important Strategy To Support Environments of Electronic Learning; The Strategy Which Increases Learners' Interaction And Participation In Electronic Environments Since Gamification With Its Activities And Loss- Winning Way Make Learning More Exciting, Competitive And Cooperative. Games Elements Include Points, Ribbons, and Virtual.

## Recommendations

- Taking Care of Training Industrial Technical Education Students on Skills of Electrical Engineering To Suit The Vocational And Academic Aspects In The Educational Field.
- Employing of Gamification- Based Environment In The Skillful And Cognitive Aspect of Technical Curricula.
- It Is Necessary To Follow Standards During Designing Gamification Learning Environment.
- Possibility of Applying Electronic Environment Based on Gamification on other Aspects Such As Attitude, Thinking And Self-Competence.
- Doing A Lot of Studies on Training Teachers On Skills of Gamification.

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