



The Interaction between Cognitive Motivation Level and Working Group Size in Web3.0 Technologies and Its Impact on Developing Self-Vocation among University Students.

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Abstract:

The current Research aimed to determine the most appropriate level of cognitive motivation and the most appropriate size for a workgroup in e-learning environment based on Web3.0 Technologies in relation to their impact on the Self-Vocation of university students, by revealing the impact of the interaction between the level of cognitive motivation (high - Low) and the size of the workgroup (medium-Small) in the e-learning environment based on Web3.0 Technologies in developing Self-Vocation for university students.

The research sample consists of (160) female students from the preparatory year students at Majmaah University in Saudi Arabia. The research tools was in the cognitive motivation scale, and Self-Vocation Scale The cognitive motivation scale was applied beforehand, monitoring the grades, and taking the higher quadrant as the height of the cognitive motivation (40 female students), The lower quadrant is as low as the cognitive Motivation (40 female students) then divide each level into medium groups (2 groups, each group consists of 10 female students) and small groups (4 groups, each group consists of 5 female students) so that the core sample (80) female students included in (4) major experimental groups (small groups are high Cognitive motivation, medium intermediate groups Effective cognitive, small groups of low cognitive motivation, and groups of medium-low cognitive motivation). The experimental processing material was to design an e-learning environment within the D2L e-learning system based on Web3.0 Technologies.

The results indicate that the e-learning environment within the D2L e-learning system based on Web3.0 Technologies helped to develop Self-Vocation among university students when working in groups within the system regardless of the size of these groups, whether small or medium, and whether these groups are high or low cognitive motivation while giving students with low cognitive motivation more training and activities.

Keywords: Cognitive motivation, workgroup size, Web3.0 Technologies, Self-Vocation.

Introduction:

The third generation of the web is one of the latest technologies used in

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education, allowing students to learn through smart phones anytime and anywhere, it saves time and effort for researchers to obtain information as it provides more relevant search results for its reliance on understanding the signs and meanings of words.

The third generation of the web provides many technologies that are used in the third generation of e-learning such as: Big Data, Intelligent Agent, Linked Data, Meta Data, and Smart Phone Learning (Dominic, et al, 2014, 10; Rudman & Bruwer, 2016, 14).

Among the applications based on the third generation technologies for the web is the D2L e-learning system provided by the Bright Space platform which was produced by the company D2L, which uses metadata technologies, linked data, and the intelligent agent and enables learning via smart phones. Through Bright Space app on Androide or IOS.

The D2L system is an integrated interactive system and works efficiently from other systems such as (Model, Black Board and SAKAI) and it combines the advantages of these systems in addition to the use of third-generation web technologies on which it is based, which makes it an interactive system not only to manage the learning content but to manage the educational system Entire (Pappas, 2016, 84; Johal, 2016, 21).

The development of self-vocation is of great importance to university students, as the results of the study (Devellis, Devellis, 2000; Meerao, 2013) indicated that the high self-efficacy of students helps to achieve goals. It also recommended many studies, including the study (Khalil Al-Rabi, 2014; Dina Ismail, 2018) on the necessity of developing the professional self-competence of university students.

The results of many previous researches and studies indicated the capabilities provided by the technologies of the third generation of the web, especially educational and educational capabilities, and among those studies and research (Ahmed Faraj, 2018; Mohamad Al-Najjar, 2016; Dominic, et al, 2014; Hussein, 2014; Hussain, 2013; Hussain, 2012; Kimbrell, 2013; Marvace, 2013; Aghaei, 2012; Ali Al-Aklabi, 2012; Lal, 2011; Padma & Seshasaayee, 2011; Faten Bamfleh, 2010).

The profession of preparatory year students at Majmaah University in the Kingdom of Saudi Arabia is to arm with a set of skills and competencies that help them to choose the appropriate specialization and prepare it and determine what can be done in the light of his capabilities and capabilities, the efficiency of that student and the tasks that he can perform are important factors in preparing it Therefore, the researcher sought to develop the self-vocation of university students by designing an e-learning environment within the D2L e-learning system based on third-generation web technologies.

Feeling the problem:

The sense of the research problem came from several basic sources, as follows:

First - Results of previous studies and research:

In light of the findings and recommendations of research and studies that dealt with the use of third-generation web technologies and the capabilities they offer and their positive impact on teaching and distance learning experiences such as a study (Faten Bamfleh, 2010; Lal, 2011; Padma & Seshasaayee, 2011; Aghaei, 2012; Ali Al-



Aklabi, 2012; Hussain, 2012; Marvace, 2013; Hussein, 2014; Kimbrell, 2013; Dominic, et al, 2014; Mohamed Al-Najjar, 2016).

The results of the study of (Devellis & Devellis, 2000, 338; Komarraju & Nadler, 2013, 67) also indicated that individuals with high self-efficacy make the greatest challenges to achieving their goals, and that the high self-efficacy of students helps in achieving goals, and gain new knowledge in performance that includes good grades and high performance. The results of the study of Iman Al-Rayes, et al. (2012) also recommended that students should be trained by providing specialized programs for them to develop multiple dimensions of self-efficacy. More specific and focused.

Several studies and research studies such as the study of (Karagüven, 2013; Amal Al-Zoghbi, 2014; Amal Saad, 2014; Khalil Al-Rabi`, 2014; Dina Ismail, 2018) have demonstrated that there is a decline in the level of self-vocation among university students and recommended the need to develop them.

The research (Dina Ismail, 2018) indicated that the e-learning management systems have had an impact in developing the self-vocation of university students. Hanan Al-Zawaidi (2018) and each of the report (Naseej Blog, 2017; Pappas, 2016) pointed out the potential offered by the D2L e-learning system based on third-generation technologies for the web on other systems and its effectiveness on other systems such as Model and Black Board.

The study of each of (Al-Najjar, 2016, 13; Toraldo, 2015; Dominic; Francis, Pilomenraj, 2014; Hussain, 2013; Moravec, 2013; Padma & Seshasaayee.b, 2011; Ahmed Syed & Rehab Syed, 2011) indicated that the use of applications based on third-generation technologies for the web provides a set of educational and learning features and capabilities, as these applications provide many technologies used in the third generation of e-learning such as Big Data, Intelligent Agent, and Linked Data, Cloud Computing, Smartphone Learning.

The e-learning system (D2L: Desire 2 Learn). One of the applications based on the third generation web technologies is Oasfh "metadata, where the system operates the associated data" linked data technology ", it allows programming a smart client" smart client ", and it can be entered into the system through the Bright Space smart phone application or any connected computer Internet device(Dominic, et al., 2014, 10).

The study of each of (Johal, Burrough, 2017; Tamer El Mallah, 2017; Naseej Blog, 2017; Johal, 2016; Heba Abdel Latif, 2016; Desire2Learn, 2008) indicated that the capabilities and tools provided by the system, the most important of which are: the e-achievement file tool e -portfolio, the LOR e-learning repository tool, which distinguishes the system from other systems with the availability of the Desire2Learn Insights reporting tool to track, analyze and evaluate the level of student achievement. Wizard, Glossary, glossary. There are many electronic communication tools inside the system, including: Blog tool, Groups tool, Discussion tool, online rooms virtual tool, Drop box delivery tool. There are also several evaluation tools inside the system, including: The Grades tool, Competences, Survey questionnaires, Rubrics, and Quizzes.

In order to achieve the greatest possible benefit from these systems, the design variables that affect their use must be studied, and here the size of the members of



working groups in electronic learning environments via the web is one of the most important educational design variables for these environments, (Nevin Al-Sayyid, Anwar Rabi, 2017, 32; Ahmed Gharib, 2014, 34-35; Weill, et al, 2011, 239-241) to the importance of learning in groups, it allows the exchange of opinions, experiences and ideas among learners about the content of learning and strengthening each other and sharing Ideas and skills training, in establishing good social relationships and developing educational skills Continued to mail them, helping them enrich learning, understanding of scientific material.

The results of previous studies and research indicated that the group size affects the different learning outcomes (Mohamed Khalaf Allah, 2017; Nevin Al-Sayed, Nahr Rabi , 2017; Zeinab Khalifa, Ahmed Al-Munem, 2016; Fayez Al-Dhafiri, And Ahmed Gharib, 2016; Hanady Abed el Samie, 2015; Ahmed Gharib, 2014; Walid Ibrahim, 2013 ; Amira El Gamal, 2012).

Previous research and studies differed on determining the most appropriate size for work groups, as there were those who indicated the preference for the small size of the group such as (Eman Abdel Aziz & others, 2018; the study of Mohamad Khalaf Allah, 2017; Zeinab Khalifa, Ahmed Abdel Moneim, 2016; Fayez Al-Dhafiri, & Ahmed Gharib Neuman2013, 2016). There are those who indicated the preference for the size of the medium groups, such as: (Hana Jamal Al-Din & others, 2017; Amira El-Gamal, 2012). Some have indicated the preference of large groups such as (Hanadi Abdel Samie, 2015). While some studies varied in their results, such as (Nevin El-Sayed, Nahr Rabi`, 2017; Mamdouh El-Feky, 2016; Walid Ibrahim, 2013). Some studies indicated equal sizes of groups (large - medium - small), such as: (Justice) Danso & Awortwe (2015) study. As a result of this difference and difference, we find that the variable size of the groups needs more study and research, so the researcher discussed this research to determine the most appropriate size for the working groups.

Electronic learning environments based on web technologies are studied after taking into account the individual differences between students, and the cognitive motivation is one of the most important of these differences. Previous research and studies such as (Marwa Habazah, and Badia Bu Ali, 2018; Israa Abd Al-Naeem, Eman Saleh, and Shaimaa Mohamed, 2018; Mohamed Tayfour, 2015; Mahmoud Bashouti, 2015; Zeinab Amin's study, Shaimaa Samir, Israa Abdel-Naeem, 2016; Intisar Qasim, 2014) to the importance of the cognitive Motivation in education.

Self- Vocation is one of the most important competencies that must be developed among university students, as previous research and studies have indicated such as (Nermeen Saleh, 2017; Ahmed Al-Sharifin, 2015; Amal Al-Zoghbi, 2014; Komarraju & Nadler, 2013, 67; Devellis & Devellis, 2000, 338) to the importance of developing Self- Vocation among students, especially university students. The results of the study (Eman Al-Rayes et al., 2012) recommended that students should be trained by providing specialized programs for them to develop multiple dimensions of self-efficacy (social, professional, and academic), especially professional competence. Results of previous research and studies, such as the study of (Dina Ismail, 2018, Amal Al-Zoghbi, 2014; Amal Saad, 2014) indicated a low level of Self- Vocation among students, especially university students.

It is clear from the above that both the cognitive motivation and the size of the



work group are fundamental variables in developing the Self- Vocation of university students, so the current research will try to shed light on the impact of both the level of cognitive motivation and the size of the work group in developing the Self- Vocation of university students Therefore, the researcher will study the effect of their interaction on third generation web technologies.

This provides the researcher's sense of the problem with the work of the researcher as a lecturer for computer skills course at Majmaah University in the Kingdom of Saudi Arabia, where the university adopted the D2L system, noting that there was a low level of Self- Vocation among students, which prompted the researcher to undertake an exploratory study represented in a measure to measure the efficiency of the professional self, which Through it, a deficiency was found in the students' Self-Vocation. The researcher reviewed the reports of female students interaction on the system and reports of students' progress in studying the learning content, which indicated that there are no interactions for students on the site and their failure to achieve the goals of learning computer skills subject as a result of not adequately communicating with the system, which prompted the researcher to conduct this research and reveal The effect of the interaction between the level of cognitive motivation and the group size in this system in the development of the self- Vocation of university students. Previous studies and research did not address within the limits of the researcher's knowledge of the variables of the level of cognitive motivation and the size of working groups in the system of D2L based on the third generation technologies of the web regarding the effect of their interaction on the development of Self- Vocation among university students.

Second - the survey study:

The researchers conducted an exploratory study to determine the reliability of the sense of the problem represented in the scale of self-vocation (Appendix No. 1: scale of professional self-competence for exploratory study), where it was applied to (20) female students of the preparatory year at Majmaah University in Saudi Arabia to determine the extent of Availability of self-vocation among students in using the tools of the electronic learning system D2L. The results are as follows: 90% of female students do not have competence in using e-communication tools within the system, 95% of female students do not have competence in using evaluation tools within the system.

Third - The previous studies and research did not directly address the research variables:

Previous studies and research did not address within the limits of the researcher's knowledge of the variables of the level of cognitive motivation and the size of working groups in the system of D2L based on the third generation technologies of the web regarding the effect of their interaction on the development of self-vocation among university students.

Fourthly - Interactive reports of the system:

The researcher reviewed the reports of female students interaction on the system and reports of students' progress in studying the learning content (Appendix No. 1 Exploratory study (interactive reports of the system)), which indicated the lack of



interaction of students on the site and their failure to achieve the goals of learning computer skills subject as a result of their inefficiency in communicating in a way Adequate system.

Which prompted the researchers to conduct this research and uncover the effect of the interaction between the level of cognitive motivation and the size of working groups in this system in developing the professional self-efficiency of university students in the use of system tools.

Research Problem:

In light of the above, the research problem could be formulated as follows:

"Low Level in the self-Vocation of university students"

This prompted the researcher to conduct this research and uncover the impact of the interaction between the levels of cognitive motivation in the system of D2L based on the third generation technologies of the Web in developing the Self- Vocation of university students. To address this problem, the current research attempts to answer the following main question:

"What is the effect of the interaction between the level of cognitive motivation and the group size in the D2L e-learning system based on third-generation technologies for the web in developing the Self- Vocation of university students?"

Where there is a need to determine the most appropriate level of cognitive motivation and the most appropriate size for work groups in the existing e-learning environment on the technologies of the third generation of the Web, in relation to its impact on developing the Self-Vocation of university students.

This main question is divided into the following questions:

1. What is the effect of two levels of cognitive motivation (high versus low) within the e-learning environment based on third-generation web technologies on developing Self-Vocation among university students?
2. What is the impact of the group size (small versus medium) within the electronic learning environment based on the technologies of the third generation of the web on developing the Self- Vocation of university students?
3. What is the effect of the interaction between the levels of cognitive motivation (high versus low), and the group size (small versus medium) within the electronic learning environment based on third-generation web technologies on developing Self-Vocation among university students?

Research Aims:

The research is aimed to determine the most appropriate level of cognitive motivation and the most appropriate size for work groups in the D2L e-learning system based on third-generation technologies for the web and that in relation to their impact on the development of Self-Vocation among university students, through:

1. Detecting of the impact of the level of cognitive motivation (high versus low) in the e-learning environment based on third generation web technologies on developing Self-Vocation among university students.
2. Detecting of the impact of the size of groups (small versus medium) in the e-

learning environment based on the technologies of the third generation of the web on the development of Self-Vocation among university students.

3. Detecting the effect of the interaction between the levels of cognitive motivation (high versus low) in the e-learning environment based on third-generation web technologies and the size of groups (small versus medium) on the development of Self-Vocation among university students.

Research Importance:

First: Applied Importance:

1. Enhance the utilization of the capabilities of the D2L e-learning system based on the technologies of the third generation of the Web to overcome the difficulties that students face when studying some courses.
2. The ability of teachers to teach e-courses via the D2L e-learning system to benefit from interactive electronic content for Self-Vocation and use it to explain the system in preparation for the course study.
3. Allows teachers who use the D2L e-learning system to benefit from a measure of Self-Vocation in measuring Self-Vocation within the system.
4. Helping the learner to deal with modern technologies used in the field of educational technology.

Second: theoretical importance.

1. Prepare a theoretical framework on the cognitive motivation, the group size, and indicate their relationship to the Self-Vocation of university students.
2. Providing designers of e-learning systems based on third-generation technologies for the web and curriculum developers with a set of principles and scientific foundations when designing these systems, with regard to the cognitive motivation and the size of working groups in these systems and the impact of each on the development of professional self-efficiencies.

Research Limits:

1. **Content limit:** The content is represented in a set of lessons related to Self-Vocation related to some electronic communication tools within the D2L e-learning system based on third-generation technologies for the web (represented in electronic communication and its importance and tools, drop box tool, groups tool, discussions, online rooms, Blogging) and Self-Vocation related to using the Quizzes tool within the system.
2. **Human limit:** A group of Majmaah University students who use the D2L system.
3. **location limit:** The application was implemented within the distance learning environment for students who have a computer or a smartphone connected to the Internet, as was the application within the computer lab for the preparatory year at Majmaah University in the Kingdom of Saudi Arabia (the workplace of the researcher) for students who do not have a computer or an internet-connected smartphone.

4. **Time limit:** The research was applied in the second semester of the academic year 2017-2018.

Research Hypotheses:

The current research sought to verify the following hypotheses:

1. There is a statistically significant difference at the level of 0.05 between the average scores of students of the two experimental groups in the measure of Self-Vocation of university students when studying in an electronic learning environment based on third-generation web technologies due to the primary effect of the difference in the level of cognitive motivation (high versus low).
2. There is a statistically significant difference at the level of 0.05 between the average scores of students of the two experimental groups in the measure of Self-Vocation of university students when studying in an electronic learning environment based on third-generation web technologies due to the basic effect of the difference in the size of the work groups (small versus medium).
3. There is no statistically significant difference at the level of 0.05 between the average scores of students of the two experimental groups in the scale of Self- Vocation among university students when studying in an electronic learning environment based on third-generation web technologies due to the primary effect of the interaction between the level of cognitive motivation (high versus low), And the size of the workgroups (small versus medium).

Measurement tools:

1. The cognitive motivation scale to measure the cognitive motivation among university students (one of the measures of cognitive motivation was chosen to be appropriate to the subject of the research, which is Isra Abdel-Naeem scale, 2016).
2. Self- Vocation Scale to measure the Self-Vocation of university students.

Research Variables:

1. **The independent variable:** the size of working groups in the D2L e-learning system that is based on third generation web technologies for university students and includes two levels (small - medium).
2. **The taxonomic independent variable:** the level of cognitive motivation in the D2L e-learning system that is based on third generation web technologies for university students and includes two levels (high - low).
3. **The dependent variable:** Self-Vocation of university students.

Research terms:

- **Cognitive Motivation:** Everyone knows (Fouad Abu Hattab & Amal Sadiq, 2000, 444; Khalil Al Maayta, 2000, 153) define the desire to know, understand,

master information, formulate and solve problems.

Procedurally defined as "the student's score in the Cognitive Motivation Scale"

- **Working group size:** A group of female students who are divided into small groups (3-5) and large groups (10-15) within the D2L learning system provided by the D2L system based on third-generation web technologies.
- **The third generation of the Web (Web 3.0):** Researchers adopt the definition of Ahmed Sayed & Rehab Sayed (2011, 206) as an executive reading and writing web that provides tools for all beneficiaries around the world to produce high-quality content and various services and applications, and machines can process, transform, collect and work on them in useful ways by making use of Artificial intelligence technologies, semantic web, geographic web, or two-dimensional web, applications can run on any computer or mobile phone), applications are very fast and are distributed via social networks and email.
- **D2L e-learning system based on third-generation technologies for the Web:** It means an integrated interactive learning environment provided by the company D2L based on the technologies of the third generation of the web (Linked Data, Meta Data, Intelligent Agent, and Smart Phones) and enables the teacher to publish lessons and goals, develop assignments and activities, and divide students into Working groups, and help to exchange ideas and opinions between teachers and students and between students and each other, and share content and application of educational activities, and communicate with teachers using a set of electronic communication tools that help in developing professional self-efficiency in using electronic communication tools University students have through multiple technologies such as drop boxes, online rooms, forums, discussions, groups, blogs, quizzes, etc.
- **Self-Vocation:** defined self-vocation as "the beliefs of individuals in their ability to perform a certain behavior or performance and their confidence in themselves to take advantage of all available capabilities to perform in a specific profession and their belief in their ability to perform the tasks assigned to them within the framework of this profession, And the consequent satisfaction and conviction in their role in the context of their profession (Amal Al-Zoghbi, 2014, 605).

The researchers defines the professional self-competence procedurally as: the total score obtained by the learner in the measure of self-vocation that the current research will use.

Theoretical framework:

The researcher will address the theoretical framework and previous studies related to each of the independent variable (third generation web technologies), the two classification variables (level of cognitive motivation and the size of work groups), and the dependent variable (self-vocation) in three main axes:

First axis - Third Generation Technologies for the Web:

1. The development of web generations:

The web has gone through many generations where (M. Rajendra Prasad, et.al.,



2013) made a comparative study between different web generations and reached a set of points that clarify the development of web generations from the first generation to the third generation and the differences between them, where the first generation arose The web in 1990-2000 and its inventor is Tim Berners Lee, which is a fixed read-only web that allows the user to browse and view the content on the network, and the data is linked by text, hyperlinks and links, and the second generation of the web originated in 2000-2010 and its inventor is Tim O Reilly, It is a dynamic web that allows the user to browse, read, and edit content by people Y subscribers across social networks, while the third generation of the web arose in 2010-2020, which was invented by Tim Berners Lee and is a development and extension of the web as it includes the characteristics of both the first and second generations of the web so you can read and browse the content, write and amend and also the implementation where people can program and share some of the content It is an interactive web based on artificial intelligence technology, and it transforms data into a language that is understood by the machine as humans, as it is a web based on the meaning and meaning of words.

2. The third generation web concept:

There are many definitions that dealt with the concept of the third generation of the web according to the opinions of specialists, including: (Padma & Seshasaayee, 2011a; Ahmed Sayed & Rehab Sayed, 2011, 206; Aghaei, 2012, 2; Muhammad Al-Najjar, 2016, 11) the researchers draws the most important points of the concept of the third generation of the web as follows:

- The Web is an evolution and extension of the World Wide Web, as it includes both the characteristics of the first generation and the second generation of the Web.
- The web is a web that allows the user to browse, read, write, edit, and implement content, as it allows the user to program and share content.
- It contains two main components: semantic technology and a social computer environment.
- It is a semantic web based on the meanings and semantics of words and converts data into a language the machine understands.
- Interactive web based on artificial intelligence technology.
- It is called the "Web of Data" as it relies on converting the web data into a language the machine understands.

3. Third generation web features:

The web applications spread on the Internet very widely, and the services provided by these applications multiplied and added to it a set of features and advantages mentioned by (Lal, 2011, 336; chiseqa, 2012, 445; Hussain, 2012, 12; Hussain, 2013, 40; Muhammad al-Najjar, 2016, 11). Among these characteristics are the following: The third generation of the web is an interactive web that relies on artificial intelligence technology in its work and management, provides semantic search by semantic search engines where it searches for words and their synonyms, by placing knowledge and terms in databases, and where it allows information to be called easily as it converts data in the form of its understanding The machine, the control of information and the ability to retrieve it from its sources. It is a social web that allows



information sharing and is characterized by ease of operation between different types of devices and the ability to update automatically continuously.

4. The structural composition of the third generation of the web and its layers and requirements:

The third generation of the web has a set of components and layers that are built on each other, and no component can operate in isolation from the previous or following component (Mohamad al-Najjar, 2016, 103; Faten Bamfleh, 2010, 30; Najla & Mustaf, 2012, 180) where the semantic web consists of data models and its application requires the use of some technologies that are tools for their representation and help to achieve the role played by the semantic web. The following shows four requirements for the work of the semantic web (Kurilovasa et al., 2014) and are: XML; RDF: Resource Description Framework; OWL: Web Ontology Language; (RDF Schema) inference engine.

Tim Berners-Lee 2001 explains that XML and RDF technology are important to the development of semantic web. XML encoding allows for the structuring of documents, and the RDF source description framework expresses the meaning.

Relationship charts, such as RDF Schema and Web Ontology Language (OWL), make it easy to describe concepts, terms, and relationships within a specific field. Ontology concept maps show the relationship between terms.

The semantic search engine contains inferential rules that use the above mentioned languages and other languages based on them to give completely logical results of inference as humans think.

5. Semantic search engines:

Semantic search engines are distinguished from the traditional with a set of advantages: The results of the Faten Bamfleh Study (2010) indicated that semantic search engines provide results that are more closely related to search terms, especially with the use of terms that carry more than one meaning, and that it provides results that are more relevant and relevant to the users' inquiries, This is because it relies on the semantics of search terms, rather than on the common ranking of sites. , And his work is based on semantic web applications, and examples of semantic search engines are: Swoogle, Exalead, Kosmix, Hakia.

6. Theoretical foundations of the third generation of the Web:

There are a set of theoretical foundations and principles that support this research, including:

- Theory of Interaction and Communication (Lee Ayers Schloesser and Michael Simonson, 2015): presented by Holmberg (1995) that states that distance learning systems increase the learner's motivation to learn and facilitate learning with the content of learning and integrates the learner into various discussions and educational activities, and taking Decisions also helps to promote real and virtual communication between the system with all its vocabulary and the learner. Within this framework, we find that the D2L system allows the creation of various educational activities and duties through the delivery folder, blogs, discussion groups and virtual classes in addition to many electronic communication tools that help in strengthening communication T communicate



- on the system, we can also create a system of educational presentations and video interactive presentations can be prepared by the teacher in advance by teaching the course, which increases the motivation of the learner to learn.
- Social learning theory (learning by observation) by Bandura (Bandura, 1997): Where Pandora sees that learning is a social process that takes place within groups of individuals and the individual learns by observing the behavior of others within groups and extracts information and develops his decisions about the style of performance he adopts, and at a later stage he performs This performance is in similar situations (Youssef Qattami, 2005) where the individual considers these others as models whose behavior is emulated (Bandura, 1977) and this theory can be applied in the system of D2L based on third-generation web technologies by dividing students into working groups and the student learns within these Groups by noticing to The behavior of others within the group and then applies this performance in other similar situations.
 - This research also supports the communication theory (Connectivism Theory) (Siemens, 2005). This theory is based on the fact that learning takes place via web networks between groups of individuals to exchange views and ideas on a specific topic shared by them through a set of electronic communication tools. The learner creates and shares content across the network between him and others, and learning is characterized by cooperation between working groups and the link between learning and other activities, and that learning in light of this theory depends on the diversity of opinions and different perspectives, and therefore the D2L system based on third-generation web technologies provides a set of Multiple electronic communication tools in which the learning content and activities are linked to delivery folders, tests, learning goals and outputs, and its performance reports on the system. The system also allows the creation of working groups, discussion groups and blogs that allow communication between groups to exchange shares. About learning content and activities and sharing activities, files, presentations and scientific projects.
 - Modern behavioral theory (Youssef Qattami, 2005; Nabil Azmy, 2016): This theory is based on reinforcement and the use of various methods of remote reinforcement such as reinforcement tools in virtual classes, or reinforcement tools in electronic tests. The use of reinforcement on an ongoing basis is a necessity to ensure continued learning by the learner. In this regard, the D2L system, based on third-generation technologies for the web, provides reinforcement tools through virtual classes and electronic tests. There are also positive and negative reinforcement tools that the teacher can include while designing tests, question banks, and a folder. Delivery. Indicates (Nabil Azmy, 2016, 132) that there are a host of other theories that support distance education, including:
 - **Social constructivist theory:** It depends on building understanding and knowledge through interacting with others, and there are multiple patterns of interaction in the D2L system based on third generation web technologies, where the learner interacts with the content activities and his interaction with his peers and with the teacher through the content page of the course to interact with the content,

And the discussion page for interacting with his peers and mentor, to other tools provided by the system.

- **Historical cultural theory:** It focuses on social interaction with the world around us and with others, as dialogue and discussion are among the most important factors for growth and knowledge building for learners and trainees through various tools and means of remote communication. This theory supports the D2L system based on third-generation technologies for the web, as it has a set of various electronic remote communication tools that allow communication and interaction between all parties of the educational process on the network and dialogue and discussion through working groups, forums or blogs and other communication tools that it provides the system.
- **The theory of cognitive sources:** emphasizes the "specific processing capacity of the human mind" while relying on various and interlinked examples and the need for a diversity of content to simplify ideas to deal with the limitations of the mind and memory. In this framework, the system enables the development of educational content and its design in various forms, such as presentations and interactive educational videos, and the establishment of links between the content elements and each other and between them and the content elements in other systems.

From the above, it is clear that there is clear support through the orientations of many theories to use the technologies of the third generation of the web and employ them in the context of designing different educational situations and the current research will adopt these theories.

7. Third generation web technologies used in the third generation of e-learning:

The third generation of the web provides many technologies that are used in the third generation of e-learning and one of the applications based on the third generation technologies for the web is the D2L system provided by the Space Bright platform which was produced by the company D2L as it uses meta data technologies, linked data, And the Intelligent Agent. The D2L system for e-learning is an integrated interactive system that works efficiently from other systems such as (Model, Black Board and SAKAI) and combines the advantages of these systems in addition to the use of third-generation web technologies that are based on it, which makes it an interactive system not only to manage the learning content but also to manage The whole system of instruction (Pappas, 2016, P.84; Johal, 2016, 21).

The system provides a set of tools and capabilities that referred to (Burrough, 2017; Tamer El Mallah, 2017; Desire 2 Learn, 2017; Naseej Blog, 2017; Johal, 2016; Heba Abdel Latif, 2016; Desire 2 Learn, 2008), including:

- The system provides an integrated set of effective communication tools such as E-mail, Blogs, Groups, Forums, Discussion, and Chat that allow students to express their opinions and offer their ideas about the material and its elements, and the Class List tool which allows the student to know the students in the system and interact with them at any time The Online Classroom tool, the system also provides an E-Portfolio file for viewing, sharing and storing files for the educational material. It also provides the Desire2Learn Capture tool for recording and broadcasting lectures via the Internet, as well as a Drop Box



delivery tool for sending assignments. It also provides The system is a set of evaluation tools, such as the creation tool Quizzes, Grades, and Rubrics are assessment forms that explain how to assess learning goals, activities, tests, and posts (Perrin, Donald, 2017, 1), and the “Self-Assessment” tool to prepare a student self-assessment, and the Competences tool, which the teacher was able to set learning outcomes and public and private goals, and link them to learning activities, content and tests. The system also supports the ability to download multiple and different types of files, whether text files, image files or web files.

- The user progres tool, which enables the teacher to monitor the performance of each student and indicate the level of progress in learning the content and the extent to which it has achieved the learning objectives and activities. The system also provides online smart phone applications in local and foreign languages and a dictionary of terms can be created in the course via the Glossary tool. The system also provides a Desire2Learn Insights reporting tool which is used to track, analyze and evaluate the level of student achievement and assess the course and educational program, institution and system.
- The system provides an “Instructional Designed Wizard” tool that allows the teacher to create an educational design for the course he is teaching, and also provides a “D2L Leap” application that performs predictive analyzes to identify weaknesses in student skills and adapt each educational path based on a level of student interaction and performance (Heba Abdel Latif, 2016).
- "Intelligent Agent" tool enables the teacher to create an intelligent agent that performs specific tasks.
- E-learning repository: Learning Repository "LOR" to manage, acquire, share and exchange learning materials to and from other learning management systems and link it to external repositories.

8. The educational capabilities of the third generation of the Web:

The technology of the third generation of the web provides a set of enormous educational capabilities, as confirmed by: (Ahmed Syed & Rehab Syed, 2011, 194; Padma & Seshasaayee, 2011, 162-170; 2013 Hussain.,; 2013, 40; Moravec Dominic, Francis & Pilomenraj, 2013, 8-14, Muhammad Al-Najjar, 2016, 13) that the third-generation technology of the web is characterized by a set of educational features and capabilities, including: It allows students to learn through smart phones through some applications, provides an environment Social, interactive, participatory, educational, it also enables education anytime, anywhere and from anyone within the participatory third-generation web environment, and third-generation web technology provides education at a lower cost N Learning by the second generation of the first generation, and do not require learners advanced computer skills.

The technology of the third generation of the web is characterized by the speed and accuracy of the information being searched for and providing support and guidance to learners when carrying out research operations (Lal, Manohar, 2011, 340), and the results of Faten Bamfleh study (2010) indicated that the search process through search engines based on third generation technologies The web provides more results related to search terms, because it relies on the semantics of search terms, which saves time and effort for researchers in the search for references and sources.

It also allows the creation of educational digital repositories and “LORs” open learning repositories (Barritt, Chuck & F. Lee Alderman Jr, 2004, 49).

Second axis - self-vocation:

The self-efficacy of the learner is reflected at the level of performance in general and his various professional competencies such as cooperation and communication with others (personal competencies) and professional competencies that are evident in his ability to display scientific material and electronic communication with others and perform the tasks required of him (Youssef Qattami, 2004, 164).

1. Concept of self-vocation:

There were many concepts that dealt with the concept of self-vocation, including (Jaber Abdel Hamid, 1986, 442; Ahmed Ramadan, 2010, 52; Amal Saad, 2014, 259-260; Bandura, 1977; Amal Al-Zoghbi, 2014, 593). The researchers conclude that self-vocation means:

- An aspect of general self-efficacy.
- Individuals believe that they are able to implement a specific behavior or performance and have confidence in themselves to take advantage of all available capabilities to perform in a specific profession and their belief in their ability to perform the tasks assigned to them within the framework of this profession.
- An individual judges his self-vocation through direct and indirect experience, as he acquires experience through activities or through the observation of his peers, and therefore judging the level of their performance at different levels and under certain conditions.

2. Factors affecting the level of self-vocation:

There are a set of factors that affect the level of self-vocation and help in improving it, which were mentioned by (Amal Al-Zoghbi, 2014, 590; Amal Saad, 2014, 26; Duran, 2004; Khalil Al-Rabi', 2014, 53) and these factors are:

- Performance achievements: which the student performs successfully increases the level of his professional competence.
- Alternative experiences: providing an opportunity for the student to observe the behavior of others in different educational situations and to obtain appropriate feedback.
- Verbal persuasion: This is done by those around the individual, by convincing him that he can succeed in performing a task, if he makes an appropriate effort.
- Emotional excitement: Encouraging the learner through stimulation and excitement reduces anxiety and stress resulting from his belief that he has less efficiency.

3. The importance of developing self-vocation:

Developing students' self-vocation helps achieve goals, and gain new knowledge in performance that includes good grades and high performance (Devellis, Devellis, 2000, 338; Meerao, 2013, 67).

High self-efficacy is one of the most important keys to the success of the student, and the awareness of individuals of their efficiency affects their academic performance in multiple ways. Self-organized learning, and they show high accuracy



in their self-evaluation of their academic performance and a high internal motivation towards homework (Ahmed Al-Alwan, Randa Al-Mahasna, 2011, 339).

The results of many research and studies indicate a direct relationship between self-efficacy and some other study variables such as motivation, performance, achievement, academic compatibility and scientific thinking such as the study (Ahmed Ramadan, 2010; Ahmed Al-Alwan, Randa Al-Mahasna, 2011, Aslan Al-Masaeed, 2011) that indicated the existence of A positive correlation between scientific thinking and self-efficacy among students of the class teacher, and Karaguvan's study, 2013); Khalil Al-Rabi`, 2014) that demonstrated that there is a relationship between self-vocation and skills development, and a study (Mubarak Midoun, 2014) that found a direct correlation between self-efficacy and academic compatibility of middle school students.

The results of the Iman Al-Rayes et al. (2012) study recommended that students should be trained to develop multiple dimensions of self-efficacy (academic, social, and professional) and focus on each aspect of their own dimension of self-efficacy dimensions in a more specific and focused manner. Dina Ismail's study (2018) indicated that the use of open-source e-learning management systems has an impact in raising the level of cognitive achievement and developing self-vocation among university students.

4. Self-vocation in using D2L system tools:

There are many electronic communication tools within the D2L system that referred to (Burrough, 2017; Tamer El Mallah, 2017; Desire 2 Learn, 2017; Naseej Blog, 2017; Johal, 2016; Heba Abdel Latif, 2016; Desire 2 Learn, 2008), including: The Blog tool is a personal website that enables you to post questions, respond to them, engage in discussions and share opinions and comments about a specific topic with other users. The Groups tool allows the teacher to create work groups and classify them according to the nature of work, projects and tasks required from each group. It also allows students to communicate with the rest of the individuals Group and file sharing and duties, a discussion tool for exchanging opinions and ideas between group members and each other and between them and the teacher on the system, an online rooms tool that allows the teacher to communicate with his students through a set of technologies such as audio conferences, video conferences and chat rooms Whiteboard, Drop Box "" to send assignments. There are also several evaluation tools within the system, including: Grades tool, Competences, Survey, Rubrics, and Quizzes.

Third axis - the cognitive motivation:

Cognitive motivation is one of the strongest drivers of learning, and it may derive in general from the motives of exploration, exploration and treatment (Fouad Abu Hatab & Amal Sadiq, 2000, 444).

There are many definitions that dealt with the definition of cognitive motivation, including: (Fouad Abu Hatab & Amal Sadiq, 2000, 444; Khalil Al-Maayta, 2000, 153; Sami Arifaj, 2000, 153) and they agreed that the cognitive motivation is the desire to know, understand, master information, formulate problems and solve them.

The study indicated both (Ahmed Balkis & Tawfiq Merhi, 1988; Nayef Qattami, 1999; Mahmoud Ghanem, 2002; Intisar Qasim; 2014) to the basic functions that



highlight the importance of cognitive motives in education as they help to stimulate activity, choose it and move behavior towards the desired goal.

The results of the study (Mahmoud Bshouti, 2015) indicated that there is a positive correlation with a statistically significant relationship between cognitive motivation and the ability to solve problems.

The cognitive motivation is among the factors that have a fundamental role in developing the self-vocation because these factors push the learner to control his information and skills in his field, and that is directed at the energy and behavior of the person in carrying out the tasks and duties required of him according to his capabilities and skills. Individuals with a high cognitive motivation are distinguished by a tendency to explore, learn, and constantly search for, obtain and develop information, and have the desire to learn new and modern experiences that evoke their mind and thinking, which helps to develop their professional competence.

Fourth axis -Working group size:

Learning in groups is one of the most important patterns of learning, as it enables students to interact with each other and enables them to develop skills of cooperation, discussion and implementation of tasks, in addition to assuming responsibility for achieving common goals that help them to unite and associate, so working within groups has many benefits. Its members include communication skills, listening, active participation and respect for the other opinion. The group shares opinions, ideas, feelings, skills, and experiences with the group.

Hanadi Abdel Samea (2015) indicated that the size of working groups has a major impact on education, as she concluded that students of a large group were more positive in all skills compared to students who studied through small sized groups.

Amira El-Gamal study (2012) indicated that the size of work groups affects the pattern of e-participation positively, as it aimed to reveal the impact of the interaction between the size of work groups on Facebook and social responsibility in e-learning environments on the development of skills of learning resources testing and the pattern of electronic participation, and the results indicated that Small and medium-sized work groups of students have a positive impact on e-participation from large-sized groups of students with high and low social responsibility alike.

Walid Ibrahim's study (2013) indicated that the size of groups affects achievement and skills as it aimed to determine the most appropriate size for a group participating in electronic discussion (large versus medium versus small) in developing critical thinking skills, cognitive achievement and student satisfaction with discussions among students of the College of Education in a course Educational technology The results indicated that the difference in the size of groups in the online discussion environment influenced achievement in favor of small groups.

The Hanadi Abdul Samee (2015) study indicated that the size of work groups is related to skills development and affects it as it aimed to measure the effectiveness of the difference in the size of groups involved in electronic brainstorming to develop critical thinking skills and the level of technological acceptance among students of educational technology, and the study found that group students Of large size they were more positive in all critical thinking skills compared to students who studied through medium size groups. They were more positive in all skills compared to students who

studied through small sized groups.

Cooperation between the members of the working group in the performance of electronic activities leads to the development of electronic communication skills among university students, and thus the development of self-vocation associated with those skills.

The results of the study of Iman Abdel Aziz and others (2018) indicated that the size of groups affects the performance of learners in electronic activities, as it demonstrated that the performance of small groups is better than the performance of medium-sized groups in electronic educational activities.

The D2L system based on the third generation technologies of the Web allows working in groups through the Groups tool as it allows the teacher to create work groups and classify them according to the nature of work, projects and tasks required of each group and allows students to communicate with the rest of the group members and share files and assignments. Therefore, the researchers believes that the size of the work groups is a fundamental variable in developing the self-vocation of university students in the use of electronic communication tools, so the current research will try to shed light on the impact of the size of the work group in developing the self-vocation.

Methodology:

The present research used the descriptive analytical approach in the study, analysis and design stage and used the quasi-experimental approach with the global experimental design 2x2 when measuring the effect of the two independent variables to search on a dependent variable in the evaluation stage. The researcher used experimental design known as Factorial design2x2

Research Procedures:

To answer the research questions and to verify the Hypotheses:

1. Seeing previous studies and research and literature related to the topic of research in the field of cognitive motivation, the group size and Self- Vocation with the aim of preparing the theoretical framework for research, preparing experimental treatment, designing research tools, and discussing its results.
2. Design and production of experimental processing material according to the general model of educational design, upload it on the site and link it to learning activities and tools on the D2L system.
3. Building the measurement tools represented by the cognitive motivation scale (one of the cognitive motivation measures was chosen to be appropriate to the subject of the research, which is Israa Abed Al-Naeem scale, 2016), and the self-Vocation Scale Professional to measure the self-Vocation of university students (prepared by the researcher).
4. Conducting the exploratory experiment for research to ensure the validity and reliability of the tools and the validity of the experimental treatment material.
5. Selecting the basic research sample and distributing students to experimental groups according to the experimental design of the research (4 main experimental groups (small groups with high cognitive motivation, medium groups with high cognitive motivation, small groups with low cognitive

motivation, and medium groups with low cognitive motivation).

6. Pre-application of measuring tools, where the cognitive motivation scale, the Self- Vocation scale, and the achievement test are provided in an electronic form.
7. Apply experimental processing material and purplish the content on the site for female students.
8. Post-application of measuring tools.

Experimental Treatment Material:

The experimental processing material was to design an e-learning environment within the D2L e-learning system based on third-generation technologies for the web and for this educational environment to be designed at a high level of efficiency, the general model for educational design was chosen ADDIE as all educational design models are similar in the general framework and revolve around five stages Chairperson: Analysis, design, development, implementation, and evaluation, which are the stages of the general model for education design, so researchers adopted this model in preparing experimental treatment material.

Analysis Stage:

- **Problem analysis and needs assessment:** The researcher identified the problem in the research plan as "the low level of self-vocation among university students, and therefore there is a need to develop low self-vocation among university students".
- **Analysis of the characteristics of learners:** they are the current research sample of preparatory year students at Majmaah University in the Kingdom of Saudi Arabia, who are registered for study in the second semester 2017-2018, and they have the skills of using the computer and the Internet and the registrants on the electronic learning system D2L based on third-generation web technologies that are approved by the university , And they have internet-connected computers and their portal behavior for self-vocation within the system is almost equal since they have never been studied this content before.
- **Analyzing the characteristics of the learning environment in which students will learn:** The D2L e-learning system environment was analyzed based on 3G technologies, and found that communication, evaluation, content and file tools on the system can be accessed via computers or smartphone, and linked to social media (blog), and various Google applications can be inserted within The system allows the teacher to create and save the content in draft form and set Tari X to publish it, and also allows the ability to edit the content after it is published, and to download videos from a computer, content files or learning repository, and the system does not allow the download of the ks video on Google Drive, which is restricted To download video links from specific sites, namely: Daily Motion, Discovery Channel, Howcast, Influxis, Khan Academy, National Geographic, School Tube, Teacher Tube, Ted, TV. Adobe, YouTube and Vimeo.
- The requirements of working on the system were computers with high-speed Internet access with the basic accessories, as was a set of required software, and



the most important of these software are: MS Office 2016, Adobe flash player, Windows or MAC OS, Microsoft Edge or Firefox Explorer, and Adobe Connect.

- **Defining goals:** Specify the general objective of the unit in "developing the professional competence of university students in the light of electronic communication tools within the system".
- **Tasks analysis:** The professional self-efficiency tasks were analyzed according to the electronic communication tools within the system and according to the overall goal of the unit. The result of this analysis was the preparation of a preliminary list of the professional competency meter and the dimensions of the professional competence scale were reached.

Design Stage:

- **Defining instructional aims:** It was formulated according to the general objectives, and it was taken into account that it is clear, measurable, and then it was judged and modified according to the opinions of the arbitrators.
- **Content identification:** The content of self-vocation and related activities has been defined in the light of general and specific aims and self-vocation, and the content has been organized from public to private, from simple to complex, and from abstract to tangible. It was approved by the judges and became in its final form includes (7) main lessons: electronic communication, its concept, importance and tools, use of the delivery folder tool, use of the discussion tool, use of groups tool, use of the virtual classroom tool, use of the blogging tool, use of the tests tool.
- **Defining methods and tools of measurement:** represented in the cognitive motivation scale and the self-vocation scale according to Rubrics to assess the activities of students and their duties.
- **Defining teaching and learning strategies, learning styles and electronic interaction methods:** collaborative learning strategy, demonstration, lecture, discussion, and self-learning across the network were used, as well as collaborative learning styles in large groups and small groups, methods of interaction and communication in the news tool, e-mail, smart agent, Discussion tool and forums, blogs on the system, and two office hours were set aside to answer female students' questions and inquiries face to face.

Development Stage:

- **Preparation for production:** The hardware and software required to produce the pre-determined experimental treatment material were prepared at the design stage.
- **Writing and word processing:** The texts were written and processed using MS Word 2016 and saved on a computer.
- **Image Capture:** Pictures of some of the system's screens related to the steps in the practical performance of skills were taken using the Snipping tool provided by MS Windows 10, processed and saved.
- **Production of educational videos:** The screenshots and videos and the necessary montage were recorded using a set of video editing production and processing

programs, including: A power soft Video Editor, Blueberry Software, Flash Back Express Flash Back Pro 5 "Professional Edition version 5.30, Wonder share Video Editor and adobe Premiere.

- **Create Glossary:** Display terms and concepts for content within Glossary within the system and link each dictionary element to content.
- **Writing goals and aims on the system:** The goals and aims are written on the system using the Competences tool.
- **Create modules:** on the system using the content tool, then upload educational presentations and videos and link the tutorials on the system with the competencies tool.
- **Create virtual rooms on the system:** A set of virtual classes has been created to explain educational lessons for students.
- **Creating homework and activity folders:** Creating homework and activity folders and setting the deadline for submitting them and creating evaluation criteria via the Rubrics assessment tool, linking tutorials to the delivery folders for each lesson and linking them to the groups' tool.
- **Include links within the content:** links to the virtual classrooms, blogs, activities and discussions are included within the educational modules and Metadata editing.
- **Training bag production:** It was produced in light of the goals and scientific content of the self-vocation scale, as a source of learning, and the training bag was saved in a PDF extension.
- **Create a smart agent:** Create a smart agent to follow the entry of female students on the site, browse the content and follow up on the implementation of tasks and activities.
- **Creating Workgroups on the System:** The Groups tool was used to create workgroups on the system according to the experimental design of the research (high and low motivational level groups are large and small), creating a file repository, delivery folder, and discussion on the system.
- **Programming the Cognitive Motivation Scale and the Professional Self-Efficiency Scale:** The Cognitive Motivation Scale and the Professional Self-Efficiency Scale were programmed using Google Forms and uploading links to the system for posting to students.
- **Programming the students' grading system in activities and tests:** A grading system has been programmed so that the grades are automatically monitored on the system once the student performs the learning tasks, and the grades are linked to the delivery and exams folder.
- **Evaluation of experimental treatment material:**
 - **Arbitration of experimental processing material:** The e-learning environment was presented to specialists in educational technology, and the proposed amendments were made.
 - **Exploratory experience:** The experimental treatment subject was applied to a survey group (10) students to ensure the extent of clarity of goals and the relevance of the content to the level of students, and to indicate any technical or programming problems that may appear during application to address them.



Implementation Stage:

The experimental treatment material was published on the system in preparation for use by female students, and the basic experiment was applied to female students of experimental groups during the second semester of the academic year 2017-2018.

Evaluation Stage:

- **Pre-evaluation:** represented in the tribal application of the measurement tools.
- **Formative evaluation:** represented in evaluating female students' participation and interaction with the learning environment and their performance of required activities, and evaluating experimental treatment material.
- **Final evaluation:** It was presented to the students after applying the treatment and represented in the post application of the measuring tools.

Statistical Treatments:

The Mann-Whitney test and the Eta square were used to measure the magnitude of the effect of both group size and cognitive motivation on self-vocation. MANOVA analysis of variance was used to find out the effect of interaction between variable workgroup size and cognitive motivation in developing self-vocation among students.

Equivalence of experimental groups at the tribal level of self-vocation:

The results of the pre-application of the measure of the self-vocation of the four experimental groups were analyzed in order to know the equivalence of the groups before experimentation.

Use One Way Analysis of variance to identify the significance of the differences between groups in the degrees of tribal application of the measure of professional self-efficacy, in relation to standard averages and standard deviations.

Table (1): averages and Standard deviations for experimental groups the four research in the pre-measurement of the level of self-vocation.

Group	First	Second	Third	Fourth	Total
averages	66.13	77.89	63.87	64.20	68.56
Standard deviations	16.62	16.56	19.52	17.51	18.20

The following table shows the results of the unidirectional variance analysis of the four groups to ensure the equality of the four groups in the pre- level of Self vocation

Table (2): Significance of differences between groups in the pre-measurement of the level of self-Vocation to verify the equivalence of experimental groups

Source of variance	Sum of squares	Freedom degree	Average	Value (F)	Significant level	Significant at (0.05)
Among the groups	2380.26	3	793.42	2.752	0.062	none significant
Within the groups	18819.67	61	308.51			
Total	21199.93	64				



The value of (f) (2.572) and the value of the level of significance (0.062) in the previous table indicate that there are no statistically significant differences between experimental groups, which indicates that the levels of students' Self-Vocation are identical before the experiment. Thus, groups can be considered equal before conducting the experiment.

Determine the appropriate statistical methods:

Two Way ANOVA: To know the effect of Interaction between the two working variables (the size of the work groups, and the cognitive drive on the dependent variable (Self- Vocation), which corresponds to the hypothesis that there is no interaction between the two working variables.

Eta squared to measure the effect of group size and cognitive motivation on the dependent variable (Self- Vocation).

Research Results:

The results related to the level of Self- Vocation:

- 1. Descriptive statistics on the level of Self- Vocation:** Table (3) shows the results of descriptive statistics for the four groups with regard to the level of Self- Vocation:

Table (3): Standard averages and deviations of students' grades in the Post-implementation of the Self- Vocation scale

Group		Group Size		Total
		Small	Medium	
Cognitive Motivation Level	High	Mean= 105.66	Mean= 106.78	Mean= 106.29
		SD = 6.007	SD = 4.61	SD = 5.21
	Low	Mean= 101.43	Mean= 99.53	Mean= 100.51
		SD= 7.71	SD = 11.89	SD = 9.83
Total		Mean= 103.48	Mean= 103.58	Mean= 103.53
		SD= 7,15	SD = 9.22	SD = 8.23

It is noted from the data presented in the table that there is a difference between the average scores in relation to the level of cognitive motivation (high versus low), and there is a difference between the average scores in relation to the variable size of groups (small versus average), and also notes from the table the difference of the averages of the four groups in the interaction framework Between them are as follows: high motivation with small groups averaging (105.66) high motivation with medium groups averaging (106.78) low motivation with small groups averaging (101.43) low motivation with medium groups averaging (99.53).

- 2. Presenting the evident results related to the level of Self- Vocation:** The following table shows the results of the two-way analysis in relation to the level of Self- Vocation.



Table (4): Two-way analysis of variance analysis to calculate the effect of the interaction between the levels of cognitive motivation

Source of variance	Average squared	F	Probability	Level of significance
Cognitive Motivation Level	530.90	8.60	0.005	significant
Group Size	2.457	0.04	0.842	non-significant
Interaction between the two variables	36.87	0.59	0.442	non-significant

By using the results of Table (4), the results can be reviewed in terms of the effect of the two independent variables of the research;

The first hypothesis:

It states: "There is a statistically significant difference at the level of 0.05 between the average scores of students of the two experimental groups in the measure of Self- Vocation of university students when studying in an electronic learning environment based on third-generation web technologies due to the primary effect of the difference in the level of cognitive motivation (high versus low).

By extrapolating the results in the first row of Table (4), it becomes clear that there is a statistically significant difference between the average students' scores in the level of Self- Vocation as a result of the difference in motivation level.

To determine the direction of these differences, table (3) was extrapolated to show that the higher mean came in favor of the experimental group with a high motivation. Then the first research hypothesis is accepted, that is, there is a statistically significant difference at the level of 0.05 between the average scores of students of the two experimental groups in the scale of Self- Vocation among university students when studying in an e-learning environment based on third-generation web technologies due to the primary effect of the different level of cognitive motivation (High versus Low) for the benefit of high motivated students. The value of the ETA squared was calculated using SPSS, and it was found that the value of the ETA squared was (0.125), a value that indicates that the difference in the level of cognitive motivation did not have a strong impact on the level of Self- Vocation.

Interpretation of the result of the first hypothesis:

The researchers attributes this result to a set of factors which are among the most important:

- encouraging students and motivating them to perform the tasks and achieving the desired goals to achieve them,
- taking into account the principles of modern behavioral theory and the use of reinforcement,
- training students adequately to develop the Self- Vocation through the training bag, educational videos, and virtual classes,
- Continuous monitoring of students to implement the activities, duties and tasks required of them through an intelligent agent,
- taking into account the principles of the epistemological theory of Pandora when designing experimental processing material, and therefore the factors that affect the level of proficiency in self-professions have been taken into account Which consisted in performance achievements, alternative experiences, verbal



- persuasion, which helped to raise the level of Self- Vocation among students.
- This result is consistent with research (Dina Ismail, 2018) that indicated that the use of e-learning systems had an impact in raising the level of Self- Vocation among students, as it is consistent with both (Amal Al Zoghbi, 2014; Amal Saad, 2014), and She agrees with (Khalil Al-Rabee, 2014; Karaguvan, 2013) which has proven that there is a relationship between Self- Vocation and skills development.

The second hypothesis:

It states: "There is a statistically significant difference at the level of 0.05 between the average scores of students of the two experimental groups in the measure of Self- Vocation of university students when studying in an e-learning environment based on third-generation web technologies due to the primary effect of the difference in the size of the work groups (small in Vs. medium)"

By extrapolating the results in the second row of Table (4), it becomes clear that there is no statistically significant difference between the average students 'scores in the level of Self- Vocation as a result of the difference in the size of the groups. Then he rejects the second research hypothesis.

The effect size of the difference in the size of the work groups (small versus the medium) was calculated on the level of Self- Vocation, by means of the ETA square using SPSS program, and it was found that the value of the ETA square is equal to (0.000) which is a value that indicates that the difference in the size of the groups had no effect on Level of Self- Vocation.

Interpretation of the result of the second hypothesis:

- The researchers attributes this to the following reasons:
- The D2L e-learning system is suitable for developing the Self- Vocation of students of small and medium groups if students are assigned various educational activities related to content and goals, providing appropriate support, providing timely feedback, assigning students to activities and training them to carry out the tasks required of them successfully, and motivating students to interact and continuously communicate and exchange Experiences between them, stimulating their motivation and continuous follow-up of students to develop their Self- Vocation.
 - Sufficient training helped students through the training bag and educational activities to develop self-efficacy Students' professionalism is consistent with a research result (Ahmed Al-Sharifin, 2015; Amal Saad, 2014).
 - The system helped to take into account the cognitive theory Pandora, where alternative experiences were available through the groups tool, which allowed the sharing of files and duties among the group members about the learning content, and gave the opportunity for each member of the group to see what others share and benefit from their experiences and exchange experiences in the field of content , Which helped to develop the professional self-competence of students of small groups and middle groups, and therefore there are no differences between them in the Self- Vocation.
 - That the design of experimental processing material according to the general



model of educational design helped to produce an accurate e-learning environment which made it suitable for learning small and medium groups and thus the small and medium groups are equal in the level of Self- Vocation.

- Taking into account the principles of social and cognitive learning theory for Pandora in the design of experimental processing material, helped in developing the professional self-competence of students and this is consistent with research (Amal Al-Zoghbi, 2014).

The third hypothesis:

It states: "There is no statistically significant difference at the level of 0.05 between the average scores of students of the two experimental groups in the measure of Self- Vocation of university students when studying in an e-learning environment based on third-generation web technologies due to the primary effect of the interaction between the level of cognitive motivation (high in Versus low), and size of workgroups (small versus medium)"

By extrapolating the results in the third row of Table (4), it becomes clear that there is no statistically significant difference at the level of (0.05) between the average levels of the level of Self- Vocation as a result of the interaction between group size (small versus average) and the level of cognitive motivation (low versus high). Then he accepts the third research hypothesis.

By calculating the size of the effect of the interaction between the level of cognitive motivation (high versus low), and the size of work groups (small versus medium) on the level of Self- Vocation, by calculating the value of the ETA squared using SPSS, it was found to be (0.000) which is a value that indicates However, the interaction between the level of cognitive motivation (high versus low) and the size of work groups (small versus medium) had no effect on the level of Self- Vocation.

Interpretation of the result of the third hypothesis:

Looking at the averages of the four groups in Table (3) it is clear that both the level of cognitive motivation (high. Low) had positive results with the size of the groups (small - medium) as the results came close and so it appears that the size of the groups in the third generation web technologies It has a positive impact with both levels as the e-learning environment within the D2L e-learning system based on third-generation web technologies has achieved high and low students the cognitive motivation and thus worked to increase their motivation to learn.

The researchers believes that the absence of an effect of the interaction between the level of cognitive motivation and the size of working groups is due to the same reasons that were mentioned in the interpretation of the first hypothesis in addition to that the system based on third-generation web technologies is suitable for learning small and medium and low groups and high cognitive motivation, especially when used in the development Self- Vocation for university student.

Recommendations:

1. Adopting and activating the D2L e-learning system in all Egyptian and Arab universities.



2. The system is suitable for learning small and medium groups of students with low and high cognitive motivation with Give students with a low cognitive drive more training and activities when working in groups on a D2L e-learning system based on third generation web technologies.
3. Holding training courses and workshops to train teachers and learners in designing and producing electronic courses on the D2L e-learning system.
4. Benefiting from the third generation web technologies that the D2L system provides, especially the interactive reports issued by the system to students, the educational institution and teachers in improving the teaching and learning process.
5. The necessity of developing the self- Vocation of university students.
6. Incorporation of the D2L e-learning system as a teaching unit within the curricula of the Education Technology Department of Faculties of Education to explain the system to students as one of the modern e-learning systems.

Research Suggestions:

1. In the light of the research findings and previous studies and research in the field of research, the researcher suggests:
2. Examine the effect of the interaction between the cognitive motivation and the size of the workgroup on third-generation web technologies in developing other competencies for students of other educational levels.
3. Examining the effectiveness of using the D2L e-learning system in developing instructional design skills within the system for student teachers in the College of Education.
4. Conduct research on the use of third-generation web technologies in developing other professional competencies in different educational stages.
5. A comparative study between the D2L e-learning system and other e-learning systems.

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