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# Project (G.O.A.L) Gamified Off-line Alterative Learning approach to grade 7 science

Projeto (G.O.A.L) Abordagem de aprendizagem alternativa offline gamificada para ciências da 7ª série

Proyecto (G.O.A.L) Enfoque de aprendizaje alternativo sin conexión gamificado para las ciencias de séptimo grado

**Dharyl C. Del Mundo**
dharylkabio17@gmail.com
Cayetano Arellano High School – Philippines
https://orcid.org/0000-0001-5389-6531

**ABSTRACT**

Understanding Physics is one of least mastered skills of Grade 7. Science as a dynamic subject that really requires higher order thinking skills in understanding and comprehending this subject, especially in this difficult time. So, as have been observed learners of the subject become more serious that lead them to be bored and not interested to the subject anymore. With the integration of ICT in the utilization of Project (G.O.A.L) Gamified Off-line Alternative Learning Material to Grade 7 Science, it will break the barriers of boredom during online class discussion of Physics 7 (Heat Transfer). This also aims to improve the learner's academic performance in Science. Project G.O.A.L was administered in Class of Grade 7. After a month-long series of educating, digitizing, and integrating Project G.O.A.L during the Covid 19 pandemic, it illustrated the great improvement of the learner's academic performance on the following topics: Heat Transfer (Conduction, Convection and Radiation). After the experimental phase, the researcher was able to give this a shot via Online Class to be able to administer well and develop vigorous learning environment in teaching Science 7 Physics, and in addition to this, to be able to promote and give awareness to the integration of ICT and games in learning Science concepts using Project G.O.A.L as a platform.

**Keywords:** Covid-19 Response, ICT Intergration, innovation, Gamification, Multimedia Learning.

**RESUMEN**

La comprensión de la física es una de las habilidades menos dominadas del grado 7. La ciencia es una materia dinámica que realmente requiere habilidades de pensamiento de orden superior para comprender y comprender esta materia, especialmente en estos momentos difíciles. Entonces, como se ha observado, los aprendices del tema se vuelven más serios, lo que los lleva a aburrirse y dejar de interesarse por el tema. Con la integración de las TIC en la utilización del material de aprendizaje alternativo fuera de línea gamificado de Project (G.O.A.L) a la ciencia de grado 7, se romperán las barreras del aburrimiento durante la discusión en clase en línea de Física 7 (Transferencia de calor). Esto también tiene como objetivo mejorar el rendimiento académico del alumno en ciencias. El Proyecto GOAL se administró en la Clase de Grado 7. Después de una serie de un mes de educación, digitalización e integración del Proyecto GOAL durante la pandemia de Covid 19, ilustró la gran mejora del rendimiento académico del alumno en los siguientes temas: Transferencia de calor (conducción , Convección y Radiación). Después de la fase experimental, el investigador pudo darle una oportunidad a través de la clase en línea para poder administrar bien y desarrollar un ambiente de aprendizaje vigoroso en la enseñanza de Ciencia 7 Física, y además de esto, para poder promover y concienciar a la Integración de ICT (Information Communication Technology) y juegos en el aprendizaje de conceptos de Ciencias utilizando el Proyecto GOAL como plataforma.

**Palabras clave:** Respuesta Covid-19, Integración ICT, innovación, Gamificación, Aprendizaje Multimedia.

**RESUMO**

Compreender a Física é uma das habilidades menos dominadas na 7ª série. Ciência como um assunto dinâmico que realmente requer habilidades de pensamento de ordem superior na compreensão e compreensão deste assunto, especialmente neste momento difícil. Assim, como tem sido observado aprendizes do assunto tornam-se mais sérios que os levam a se aborrecerem e não se interessarem mais pelo assunto. Com a integração das TIC na utilização do Projeto (G.O.A.L) Material de Aprendizagem Alternativo Off-line Gamified para Ciências da 7ª Série, isso quebrará as barreiras do tédio durante a discussão em aula online de Física 7 (Transferência de Calor). Isso também visa melhorar o desempenho acadêmico do aluno em Ciências. O Projeto G.O.A.L foi administrado na turma da 7ª série. Após uma série de um mês de educação, digitalização e integração do Projeto GOAL durante a pandemia de Covid 19, ele ilustrou a grande melhora no desempenho acadêmico do aluno nos seguintes tópicos: Transferência de Calor (Condução , Convecção e Radiação). Após a fase experimental, o pesquisador conseguiu dar um tiro através da Aula Online para poder administrar bem e desenvolver um ambiente vigoroso de aprendizagem no ensino da Física das Ciências 7 e, além

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disso, poder promover e conscientizar os integração de ICT e jogos na aprendizagem de conceitos de Ciências utilizando o Projeto G.O.A.L como plataforma.

**Palavras-chave:** Resposta da Covid 19, Integração de ICT, inovação, Gamificação, Aprendizagem multimídia.

## 1 INTRODUCTION

Dealing in the world full of changes and everything is affected by it, majority around us was forced to accept and live with it. Living in today's generation in the middle of the pandemic teaches us a lot of things from personal to professional to the field of the academes, knowing that we are in the new normal set up of teaching and learning process in the Philippines.

It is indeed a challenge to all of the teachers and learners to learn since full online distant learning was implemented in our country. The assurance of understanding and comprehension of the students is not secured since teachers here in the Philippines are well trained in a classroom face to face set up. Food is not just the essential, learning is very essential too,for He defines learning as "a persisting change in human performance or performance potential…[which] must come about as a result of the learner's experience and interaction with the world" (Driscoll, 2000, p.11). This definition envelops numerous properties commonly related with behaviorism, cognitivism, and constructivism – specifically, learning as an enduring changed state (emotional, mental, physiological (i.e. skills). Numerous conventional and new way of learning strategies were tried and used to be able to improve student's academic performances from students who are bored with very small attention span. Thus, no matter what hypotheses of learning with which a commonplace, today's students can learn with confirmation that each strategy is still pertinent within the advanced age. In addition to this, the learners must be connected by the teacher to the lesson in a deeper understanding and to create a meaningful learning experience with the use of new technologies used in education. Learners can also learn a lot through by experiencing it or sometimes known as hands-on activity where it is like the Experiential Learning of Kolb "which concerns the learner's internal cognitive processes" (Saul McLeod, 2010). Together with this, the Activity-based learning (ABL) as defined by Prince (2004) is a learning method in which students are engaged in the learning processes. These two types of method must connect to the interest of the learners to arouse their thirst for knowledge even during their online distance classes.

At this moment and even before the pandemic, the Department of Education adapts the utilization of Multimedia by means of (ICT) Information and Communication Technology. This is to aware the learners and teachers as well that technology can be a tool to help them to learn in an engaging way. That is why DepEd has DO 62, s. 2009 - Guidelines in Managing Existing Multimedia Materials in Schools. Also, in DO 57, s. 2011 - Policy Guidelines in the Implementation of the Special Science Elementary Schools (SSES) Project wherein Section 17, Article II of the Philippine Constitution mandates the State to give priority to Education, Science and Technology to foster patriotism and nationalism, accelerate social programs and promote total human development. Section 10, Article XIV further states that Science and Technology are essential for nationalism, development, invention, innovation, and their utilization. Providing opportunities for the development of scientific attitudes, technological skills and higher order thinking skills among learners of Basic Education in an environment supportive of their nurturance is the primary responsibility of the Department of Education (DepEd).

So to address the need, this research project was made because Science is dynamic, and must be taught with the integration of ICT or multimedia for better understanding despite the lack of equipment, tools, applications and the like. Science is also perceived as one of the hardest subjects and cannot be learnt in an instant without the real experiment or the hands-on activity, hence the researcher therefore made innovative way through the inclusion of Project (G.O.A.L) Gamified Off-line Alternative Learning approach simply because "Students assume greater responsibility for their own learning when they use (ICT) Information and Communication

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Technology, working more independently and effectively with or without the interruption of internet. ICT offers learners assignments better suited to individual needs and makes it easier to organize their own learning, through the use of digital portfolios and others alike" (Balanskat, 2006). Activities via multimedia are means of presentation to the child both problems and solutions of life's experiences which emphasize lessons of discipline knowledge, skills, innovation, integration and values vital for growth and development.

Furthermore, the addition of Gamification principle becomes the trend in the field of education especially in teaching Science, concepts highly influenced the teaching and learning of students in various ways. It does touch also the behovioral motivation of the learner to be able to learn and be easily infused with digital media icluding the subject matter (Cheong, et al., 2013) to elevate students' motivation and increase academic performances amidst the new normal set up of education in the Philippines.

**Research Poblems/Questions:**

The research sought to answer the following specific questions:

1. What is the mastery level of the (G.O.A.L) Gamified Offline Alternative Learning material content in:

    1.1) Activity Card

    1.2) Enrichment Card

    1.3) Assessment Card

2. What is the pre-test mean score performance?

    2.1) (G.O.A.L) Gamified Offline Alternative Learning group

    2.2) (Non-G.O.A.L) Non-Gamified Offline Alternative Learning group

3. What is the post-test mean score performance?

    3.1) (G.O.A.L) Gamified Offline Alternative Learning group

    3.2) (Non-G.O.A.L) Non-Gamified Offline Alternative Learning group

4. Is there a significant difference between the pre-test and post-test score of the respondents as to:

    4.1) (G.O.A.L) Gamified Offline Alternative Learning group

    4.2) (Non-G.O.A.L) Non-Gamified Offline Alternative Learning group

Hypotheses:

Null – There is no significant difference between the pre-test and post-test score of the respondents.

## 2 THEORETICAL FOUNDATIONS

Science was considered as one of the major subjects within the academes that will exceedingly influence the totality of the learner's performance in school. So, to be able to manage up with sudden alter, our instructive framework must to grant ways to a few advancements and changes. For this reason, instruction nowadays have been affected by the numerous variables. In this chapter you may see a few ponders and writing that legitimize the implementation of Project (G.O.A.L) approach and how it influenced the students' scholastic status.

Concurring to Florentino B. Abad (October 18, 2004) in his discourse entitled "empowering schools to progress Philippine education" he detailed that the most recent subjects. The drift in worldwide arithmetic and science consider. Out of 38 nations, we put third to the final that 36th set within the field of 38. In line with this year's congress subject, we have ascribed destitute scores in English, Math, and Science to our student's need of capacity in something as essential as perusing and comprehension. He recognizes the emergency that the instructive framework is experiencing,

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and among these, the secretary alluded to be the destitute execution of Filipino students in national and universal demonstrative test.

## 2.1 ICT integration in Education

Based on a helpful learning approach, ICT makes a difference unders tudies centered on higher-level concepts instead of less significant errands (Levin & Wadmany, 2006). McMahon's ponder (2009) appeared that there were measurably noteworthy relationships between considering with ICT and the procurement of basic considering skills. A longer presentation within the ICT environment can cultivate students' higher basic considering abilities. In this way, schools are emphatically prompted to coordinated innovation over all of the learning areas and among all learning levels. Where this can be done, students are able to apply innovation to the achievement of higher levels of cognition inside particular learning settings.

As Lowther et al. (2008) have expressed that there are three critical characteristics required to create great quality educating and learning with ICT: independence, capability, and imagination. Independence implies that understudies take control of their learning through their utilization of ICT. In this way, they gotten to be more able of working by themselves and with others. Instructors can moreover authorize students to total certain assignments with peers or in bunches. Through collaborative learning with ICT, the students have more opportunity to construct the modern information onto their foundation information, and ended up more sure to require dangers and learn from their botches. Serhan (2009) concluded that ICT cultivates autonomy by permitting teachers to form their possess fabric, in this way giving more control over course substance than is conceivable in a conventional classroom setting. With respect to capability, once understudies are more certain in learning forms, they can create the capability to apply and exchange information whereas utilizing unused innovation with proficiency and viability.

## 2.2 Gamification in Teaching process

Engaging students in the new normal setting in education is highly challenging in so many ways especially to the teachers. An environment very different from the classroom setting, a new ecosystem of learning with the integration of ICT and making every learning meaningful. Since games are very prominent to all the generation of today using different gadgets such as laptop, cellphones, tablets and etc. as their primary game tool. In this way, students hooked up with this kind of technology based and most of the time consumes a lot of their time. Computerized gaming is presently sought after by a majority of the living in the population of the first world. The age extend of gamers gets more youthful each year whereas experienced gamers proceed to play well past childhood (Arnold 2014). Progressions in portable innovation encourage extend openings for game-play, permitting participants to engage any time from any place. Anybody who possesses a smartphone or tablet can become a gamer. Mobile games that are free proliferate, and the foremost well-known have ended up broadly utilized outlets for social interaction and interfacing family and companions, such as "Words with Friends" — a advanced take on Scrabble. Social organizing highlights of versatile diversions bolster the predominance of game play in a culture that's progressively concerned with remaining in touch and being associated all of the time; in this sense, the appeal of online recreations isn't close to who is playing, but who in one's individual organize is playing. (New Horizon Report, 2013). Furthermore, lessons that are gamified will surely catch the attention and interaction between the students, teachers and technology that soon will be able to improve their performances academically.

This study was differently made for the 21st Century Learners which focuses on Activity Based mixed with the use of Multimedia or ICT that is game inspired in the process of learning and teaching. The researcher utilized a specific preferred Computer Simulated Materials such as Phet and Boardworks software as an enhancer and supplement in their performance in the academes.

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This study also wants to amplify how the inclusion of Project G.O.A.L approach highly affects their cognitive ability towards the development of their performances specifically in science activities.

## 3 METHODOLOGICAL PROCEDURES

### Research Design

The pretest-posttest none-equivalent Project (G.O.A.L) Gamified Offline Alternative Learning approach was used in the study, a quasi- experimental design as illustrated below:

E $O_1$ x $O_2$
C $O_1$ $O_2$

Where:
*E is the with Project (G.O.A.L) Gamified Offline Alternative Learning approach through Interactive Strategic Instructional Material.
*C is the without Project (G.O.A.L) Gamified Offline Alternative Learning approach through Interactive Strategic Instructional Material.
*$O_1$ is the administration of the pre-test
*$O_2$ is the administration of the post-test
*X is the administration of the treatment

### 3. 1 PARTICIPANTS/DATA SOURCE

The study of the Utilization of (G.O.A.L) Gamified Offline Alternative Learning material approach through of the Grade 7 Science learners was ministered at Cayetano Arellano High School, a public school located at Teodora Alonzo St. Sta. Cruz, Manila, Philippines.

### 3.2 DATA GATHERING PROCEDURES AND INSTRUMENTS

To be able to measure the effectiveness of the utilization of (G.O.A.L) through ISIM in the academic performance of students in Grade 7 Science (Physics), pretest and posttest were administered via online by sending the Google form link. ). Then, the basis of the grouping was by Random sampling technique then divide them into (G.O.A.L) group and Non-(G.O.A.L) group. The treated group was exposed to ISIM as their gamified instructional material and the non-treated group was in the synchronous type of class discussion. Afterwards, researcher-made Post-test questionnaire which was digitized was used to determine the improvement of the academic performance of students in learning Science 7 (Physics) concepts. Data and results were statistically done from a month-long experiment focusing on topics: About Heat Transfer as one of the least mastered skills which covers: Conduction, Convection and Radiation and were supported and verified by observations.

### 3.3 DATA ANALYSIS

The gathered data were treated statistically by getting the Mean score, Standard Deviation, T-test and Mastery level of each activity to be able to see the improvement and effectiveness of integrating (G.O.A.L) approach in teaching Science 7 (Physics).

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## 4 RESULTS and DISCUSSIONS

Analysis and interpretation of the gathered data were summarized in the following tables.

1. What is the mastery level of the (G.O.A.L) Gamified Offline Alternative Learning material content in:

**Table 1.1**
*Activity Card*

| GOAL part | MEAN SCORE | Standard Deviation | Mastery Level | Interpretation |
|---|---|---|---|---|
| **Activity Card** | 25.83 | 0.48 | 99.36% | High Mastery |

**Table 1.2**
*Enrichment Card*

| GOAL part | MEAN SCORE | Standard Deviation | Mastery Level | Interpretation |
|---|---|---|---|---|
| **Enrichment Card** | 40.47 | 1.18 | 98.70% | High Mastery |

**Table 1.3**
*Assessment Card*

| GOAL part | MEAN SCORE | Standard Deviation | Mastery Level | Interpretation |
|---|---|---|---|---|
| **Assessment Card** | 14.80 | 0.63 | 98.67% | High Mastery |

**Table 1.4**
*Mastery Level*

| Numerical Value | Descriptive interpretation |
|---|---|
| 76 - 100 % | High mastery |
| 51 - 75 % | Mastered |
| 26 - 50 % | Low mastery |
| 0 - 25 % | Very low mastery |

Tables 1.1-1.3 shows that the students highly mastered each category namely: Activity card, Enrichment card and Assessment card. Meaning to say that learning with the use of GOAL highly affects the student's cognitive ability and improve class performance.

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**Table 2**

*Pre-test Scores of responds on a 20-item test*

| | **Mean score** | **SD** |
|---|---|---|
| **GOAL group** | 7.87 | 2.95 |
| **Non-GOAL group** | 6 | 2.67 |

Table 2 shows the pretest score which has 15 respondents in each group that conduct a 30-item test. Based on the computed data the non-GOAL group has less mean value of 6 than the GOAL group which has greater mean value which is 7.87, which are close enough to one another and when the researcher computes the standard deviation of different groups the non-GOAL group got the lesser SD value of 2.67 than the experimental group that has a SD value of 2.95 respectively. Meaning to say that both groups doesn't have enough knowledge on the given topic simply because the difference is close enough to each group.

**Table 3**

*Post-test Scores of responds on a 20-item test*

| | **Mean score** | **SD** |
|---|---|---|
| **GOAL group** | 13.6 | 3.06 |
| **Non-GOAL group** | 5.6 | 1.59 |

Table 3 shows the post-test scores of the GOAL group, it has 13.6 mean value while on the other hand the non-GOAL group has 5.6 mean value only. The table shows the computed mean value of the experimental group is greater than the control group's mean value of the post-test of both groups. The standard deviation of (GOAL) group is greater than the Non-GOAL (Non-Gamified Offline Alternative Learning) approach group which are 3.06 than 1.59, respectively. Meaning, the students in the (GOAL) group scores increased much.

2. What is the pre-test mean score performance?

**Table 4.1**

*Test of difference of the pre-test and post-test scores*
*Between pre-test to pre-test group*

| **Subject** | **Respondent** | **Mean** | **SD** | **Computed t-value** | **Tabular t-value; 0.05,29 df** | **Decision** | **Interpretation** |
|---|---|---|---|---|---|---|---|
| **(GOAL)** Experimental group | 15 | 7.87 | 2.95 | ± 1.82 | 2.042 | Accept the Null Hypothesis | Not Significant |
| **(Non GOAL)** Control grp. | 15 | 6 | 2.67 | | | | |

Since the computed value is 1.82 lesser than the tabular value of 2.042, then accept the null hypothesis. Therefore, at 0.05 level of significance of the pre-test performance of GOAL group is comparable with the Non-GOAL group.

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3. What is the post-test mean score performance?

**Table 4.2**
*Test of difference of the pre-test and post-test scores*
*Between post-test and post-test scores of both groups*

| Subject | Respondent | Mean | SD | Computed t-value | Tabular t-value; 0.05,29 df | Decision | Interpretation |
|---|---|---|---|---|---|---|---|
| **(GOAL)** Experimental group | 15 | 18.53 | 4.46 | ± 8.97 | 2.042 | Reject the Null Hypothesis | Significant |
| **(Non GOAL)** Control grp | 15 | 15.53 | 2.70 | | | | |

Results shown in Table 4.2 shows a computed value of ± 8.97 which is greater than the tabular value of 2.042. Thus, the null hypothesis is rejected. Therefore, by conventional criteria, this difference is significant between the post-test performance of GOAL group and non-GOAL group.

4. Is there a significant difference between the pre-test and post-test score of the respondents as to:

**Table 4.3**
*Pre-test and Post-test of GOAL group*

| Test | Mean | SD | Computed t-value | Tabular t-value; 0.05,14 df | Decision | Interpretation |
|---|---|---|---|---|---|---|
| **Pre-test** | 7.87 | 2.95 | ± 9.02 | 2.145 | Reject the Null Hypothesis | Significant |
| **Post-test** | 13.6 | 3.06 | | | | |

Since the computed value of ± 9.02 is greater than the tabular value of 2.145, the null hypothesis is rejected. Therefore, at 0.05 level of significance the Post-test score is higher than the Pre-test score of GOAL group.

**Table 4.4**
*Pre-test and Post-test of Non-GOAL group*

| Test | Mean | SD | Computed t-value | Tabular t-value; 0.05,14 df | Decision | Interpretation |
|---|---|---|---|---|---|---|
| **Pre-test** | 6 | 2.67 | ± 0.76 | 2.145 | Accept the Null Hypothesis | Not Significant |
| **Post-test** | 5.6 | 1.59 | | | | |

Based on the table above the computed value of ± 0.76 is less than the tabular value of 2.145 indicating that the null hypothesis is accepted. Therefore, there is no significant difference between the Pre-test and Post-test scores of non-GOAL.

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## 5 CONCLUSION

In the light of the foregoing findings, the following conclusions were drawn: the following conclusion had been gathered and interpreted by the researcher, wherein the use of Gamified Offline Alternative Learning approach (GOAL) was effective and efficient in the development of learners' academic performance in studying Science 7 (Physics).

1. The respondents both in the GOAL and Non-GOAL group have equal entry of knowledge thus; they are equal in terms of mental ability. Both groups of respondents have the same outlook and perception in the study of science.

2. The use of Multimedia such as the Computer Simulated Materials such as I-SIM and Phet during the lesson proper as an instructional material, indicates that this could be an effective intervention to break the ice in learning Science concepts, thus Mastery of each activity card increased. Since there is a significant difference between the pre-test and post-test scores in the GOAL group students their academic performance improved to stimulate their minds to think, analyze and understand the subject, in terms of their behavior toward studying the subject.

3. The non-treated of GOAL during the activity proper could still be effective method of transmitting knowledge. The attitude of the learners towards the subject matter is still the same-complicated, difficult, boring and brain dead. Engaging the students in a Gamified Offline Alternative Learning approach enhanced their learning, in such a way that they were motivated to study and stimulate their mind to think and understand the lessons taken up. Students appreciated this kind of strategy as manifested in the results of pretest and posttest in 30- item test of the GOAL. These students get excited when it is already in the part of the lesson (activity proper) because of the enjoyment they have while manipulating the Computer Simulated Materials. Letting them manipulate computer and tablet during the activity proper motivated them and killed the silence of boredom to understand, analyze and think well the concepts.

4. Having an experience in using the Gamified Offline Alternative Learning approach in computer during the lesson proper part helped the respondents to attain good scores; this positively affects the performance in 20- item test. There was an effect in the gain scores in test of the Non-GOAL and GOAL group, but GOAL is more effective than that of the non-GOAL because the students responded actively during the treatment period. Thus, the intervention (GOAL) during the activity proper highly affects the academic performance towards science concepts.

### REFERENCES

Arnold, B. (2014, January). Gamification in Education. Https://Www.Researchgate.Net/Publication/295401531_Gamification_in_Education. https://www.researchgate.net/publication/295401531

Bonifacio, A. (2013). Developing Information Communication Technology (ICT) Curriculum Standards for K-12 Schools in the Philippines. Developing Information Communication Technology (ICT) Curriculum Standards for K-12 Schools in the Philippines, 2–8. https://linc.mit.edu/linc2013/proceedings/Session7/Session7Bonifacio.pdf

Cheong, C., Cheong, F., & Filippou, J. (2013, June 18). Quick Quiz: A Gamified Approach for Enhancing Learning. Https://Aisel.Aisnet.Org/Cgi/Viewcontent.Cgi?Article=1206&context=pacis2013. https://aisel.aisnet.org/cgi/viewcontent.cgi?article=1206&context=pacis2013

Perkins, W. (2019, June 4). Learning Theories and Classroom Technology. Https://Languagearts.Education/.http://www.sanfordbrown.edu/Student-Life/blog/March-2015/Four-Top-Learning-Theories-in-the-Age

Siemens, G. (n.d.). Connectivism:A Learning Theory for the Digital Age. Retrieved October 18,2020, from https://www.itdl.org/Journal/Jan_05/article01.htm