

A study on Systematic review of Gamification in Education Sector

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1. INTRODUCTION

Game based learning has gained importance recently. Because of its playful nature it is able to motivate and attract students. Explaining the concept through games is a technique to make students learn better. Students have wide experience with respect to master, understanding , enjoyment and motivation [1].

During 2000 the main form of E learning was different as compared to it in present form. Use of DVDs, CD RoM, floppy disk was used. With advancement in technology it has moved to use through mobile, laptop and other social media websites that includes Facebook, whatsapps, Amazon and many more [2].

From 2010 onwards the concept of gamification has increased. It has motivated researcher and academician to explore more on this topic. Further the report published by Gartner and IEEE in 2011 and 2014 respectively emphasized the importance of gamification in the near future. They believed that use of gamification is going to be increased more and more with advancement of technology. Use of gamification in different fields is emphasized . it includes wide areas such as ERP; education[3][4];[5];[6];[7];[8]; [9]; [10]; [11]; [12]; health [13], [14]; ecommerce; advertising and many more.

2. REVIEW OF LITERATURE

2.1 To analyze the factors that affects student engagement

Education can be enhanced if we use gamification with various school activities [15]. Gamification also contribute in enhancing teamwork, enjoyment and wellbeing when people work together [16]. Gamification also ecouages good stress as people start experiencing success. So there are number of benefits associated with gamification, from collaboration and engagement to learning and feedback [16].

2.2 Motivation behind gamification

The term gamification means introducing the video gaming element into non gaming systems to improve overall user engagement and experience [17]. Offline and online popularity of computer games helps in shaping the motivational spectrum of young students. Popularity of gamification is totally dependent on its success, as these days it is commonly used in many online classes [5]. Students prefer gamification because they get instant feedback which helps in building engagement and because of this students attend classes regularly which boost their intention to learn.

2.3 Relationship of pleasure on student engagement

Gaming feature provides delight to the educational design which is required to engage the learners. Incorporating game element into the classroom environment will facilitate engagement. Limited research has been done on multiple levels and their long term effect on motivating the learners.

2.4 Involvement of emotions, fun and play in gamification

Evidence shows that there is a strong relationship between human psychological needs and effective use of gamification, these needs are connected to self-determination theory [18]. According to the sixteen learning theories games are the valuable tool for learning and education. In gamification target behaviours of the users can be changed if we incorporate fun factors and device activity cycles by using appropriate tools.

3. RESEARCH METHODOLOGY

After review of published literature seven major variables have been identified to explore the topics that includes:

3.1 METHOD

Research is an integrated and systematic way of doing a review. It is helpful to gather information on the topic, “Gamification on Education sector.” It analyze the weaknesses and gaps that provide the chance to rectify the things, to improve and upgrade and to add something in existing literature.

In this paper the analysis has been done through meta analysis and the following steps has been taken for analysis

- a. Collecting 2000 abstracts on the topic Gamification on Education sector.
- b. Out of 2000 abstracts 250 research papers are downloaded related Gamification on Education sector.
- c. And in last coding is done on 50 papers that are related to **7 selected variables**. The variables are selected after doing a proper literature review.

d. The research papers/articles are downloaded from google scholar, google advance, elsevier, Inderscience, emerald directly on selected variables.

e. The analysis is done in a graphical way by using pie-charts, percentages and Bar graphs.

In this paper a process given by “Lage Junior and GodinhoFilho” has been used. the papers are selected and downloaded from different publication, i.e. emerald, Elsevier’s , Inderscience, research gate etc. To conduct a study order and numbering of the articles are given presented in table1. After data collection and analyzing the various articles on “Gamification on Education sector.” the data is classified into 1-8 large sub heads and coded by the letters from A to H. The articles in the sub head can receive more than one code. Each and every paper is classified and given a coding.

The first classification involves identifying the context which contain coding of A, B and C. The **context** here means whether papers reviewed in from developing countries or developed countries or related to both. The second classification involves identifying the geographical area which contain coding from A –F which shows that the research paper which is being reviewed is related to which country. The third classification involves the identifying of objective of the research paper which is given coding from A-D. This classification describes what kind objective it have i.e empirical, case study, literature review, conceptual or any other. The fourth classification describes the main subject which is given coding from A-G. The main subject meanstopic of research paper under study. The fifth classification describes the methods which contain coding from A-C. The sixth classification describes the sector taken for study, it have provided coding from A-D. The seventh classification describes the Topic which is coded from A-H. The last classification describes the result or outcome of article reviewed provide a new perspective, or it is consistent with previous study or it is a comparative study .the coding are given from A-D as shown in a table 1.

3.2 DATA SHEET

Table 1

Context	A-Developing Countries & Emerging Countries B- Developed countries C- Both (Developing and developed countries)
Geographical Area	A- USA and Canada B- India C- Europe D-Asia excluding India E-Australia F-Others countries
Objective of research paper	A-Empirical Study B-Literature Review C-Case study

	D- Conceptual
Main subject	A- To analyze the factors that affects student engagement B- To study the impact of social pressure on gamification. C- Motivation behind gamification D-Relationship of pleasure on student engagement E-Involvement of emotions, fun and play in gamification F- Role of innovation in gamification G- Understanding the concept of gamification H- Others
Method	A – Quantitative B – Qualitative C – both
Sector Analysis	A- Accessibility B- Engagement C- Behaviorism D- Autonomous
Topic	A-Personal factors and gamification B-Enjoyment and student engagement in gamification C- Effect of teachers attituded on gamification D- Gamification in higher education E-Interactive gamification learning F- Classification of games G- Citation network analysis
Result	A-New perspectives B- Consistent with previous literature C- Comparative study D- Non-applicable

4. DATA ANALYSIS AND INTERPRETATION

All classification and respective coding is applied to each of every 48 research paper downloaded and selected on the topic “Gamification on Education sector.” presented in table 2.

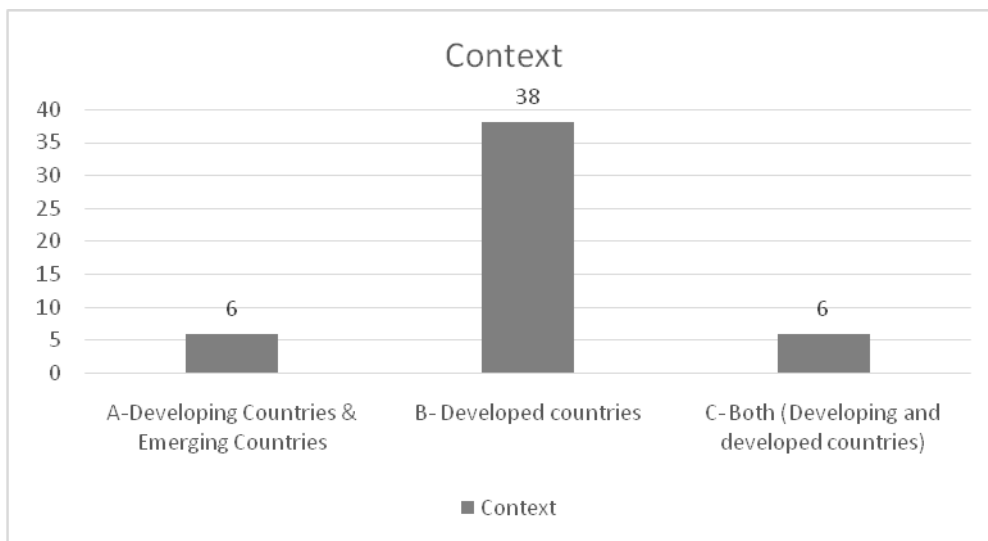
Table 2

S. No.	Context	Geographical Area	Objective of research papers under study	Main subject of research of research paper under study	Method	Sector analysis	Topic	Result
1	B	A	D	A	B	A	A	B
2	B	A	A	H	C	A	G	D
3	B	A	C	A	B	B	B	A
4	A	F	D	F	B	B	D	B
5	A	D	A	D	C	C	E	A
6	A	C	D	H	C	C	F	A
7	B	C	D	E	C	D	F	B
8	B	C	D	A	A	C	C	A
9	B	C	D	C	B	B	D	A
10	B	C	A	C	C	C	B	C
11	B	C	D	D	C	B	B	C
12	B	C	D	C	C	C	A	A
13	B	C	A	A	B	C	A,C,D	C
14	B	A	C	H	B	D	A	B
15	C	A,B,C,D,E,F	A	G	B	B	E	B
16	B	A	A	G	B	D	A	B
17	C	A,B,C,D,E,F	B	F	B	B	E	B
18	C	F	A	A	B	B	B	A
19	B	A	B	G	B	D	C	A
20	B	A	C	E	B	C&B	B	A
21	B	C	A	B	B	D	E	A
22	B	A	B	F	B	B	A	A
23	B	A	A	A	B	B	B	A
24	B	A	A	G	B	B	A	A
25	B	A	D	G	B	B	C	A
26	C	D	B	E	B	D	B	A
27	B	A	A	F	B	D	A&D	B
28	B	C	B	F	A	D	A	A

29	B	C	B	F	C	D	D	A
30	B	C	D	G	C	D	D&F	A
31	B	A	D	A	B	A	A	B
32	B	A	A	H	C	A	G	D
33	B	A	C	A	B	B	B	A
34	A	F	D	F	B	B	D	B
35	A	D	A	D	C	C	E	A
36	A	C	D	H	C	C	F	A
37	B	C	D	E	C	D	F	B
38	B	C	D	A	A	C	C	A
39	B	C	D	C	B	B	D	A
40	B	C	A	C	C	C	B	C
41	C	F	A	A	B	B	B	A
42	B	A	B	G	B	D	C	A
43	B	A	C	E	B	C&B	B	A
44	B	C	A	B	B	D	E	A
45	B	A	B	F	B	B	A	A
46	B	A	A	A	B	B	B	A
47	B	A	A	G	B	B	A	A
48	B	A	D	G	B	B	C	A
49	C	D	B	E	B	D	B	A
50	B	A	A	F	B	D	A&D	B

4.1 Context :The first classification involves identifying the context which contain coding of A,B&C. A- Developing Countries & Emerging Countries, B- Developed countries & C- Both (Developing and developed countries). The result we obtained after analyzing or reviewing the 50 research papers is that the study is done on both developing as well as developed countries but major role is played by the developing and emerging countries.

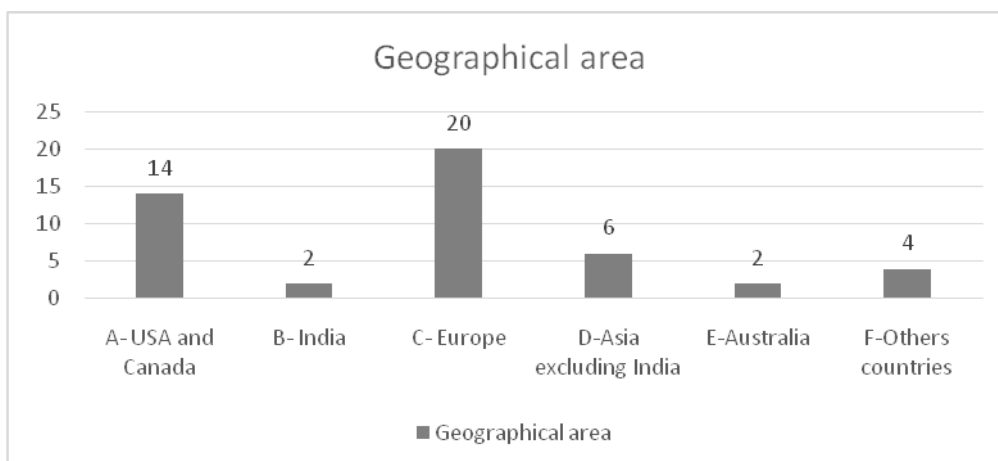
Figure 1



Research gap- As we can see from the above chart that Developed countries have contributed more in case of gamification in education as total of 38 papers were on developed countries as compared to developing countries on which only 6 papers were written. We can clearly see the gap between the developed and developing countries as the total difference is of 32 between developed and developing countries.

4.2 Geographical area: The second classification involves identifying the geographical area which is related to specific region related to that particular country and contain coding from A –F where A- USA and Canada, B-India, C- Europe, D- Asia excluding India, E- Australia, F- Other The classification has taken into diversity of papers. The analysis can be better seen in figure 2.

Figure 2

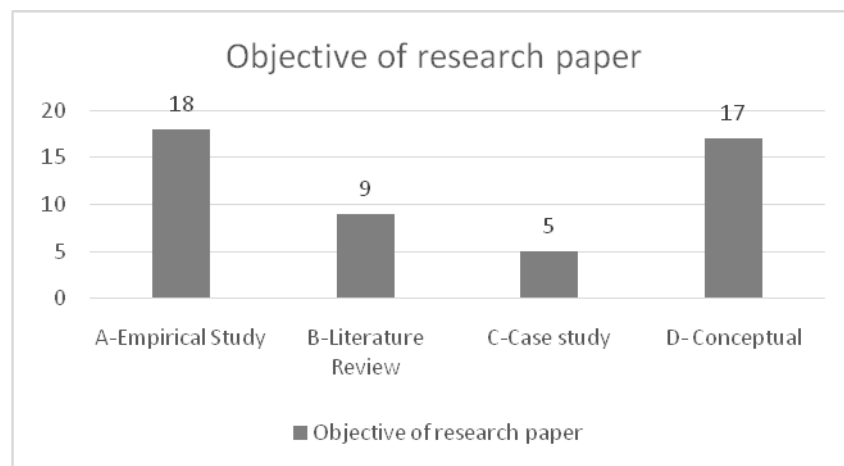


Research gap- The area where this study was conducted the most after reviewing 50 papers and total of 20 papers were written on Europe and mainly Finland where gamification in education is not a challenge for students as well as for teachers but the country or countries who are lacking behind and are still facing challenges in accepting this method of education after viewing 50 papers were India and Australia where only total of 2 papers for each were

found. As we know Europe is a continent and India and Australia are countries still if we see the gap the total difference is of 18.

4.3 Objective of research papers under studyThe third classification involves identifying of objective of the research paper which is given coding from A-D where, A-Empirical study, B-Literature review, C-Case study, D-Conceptual .

Figure 3

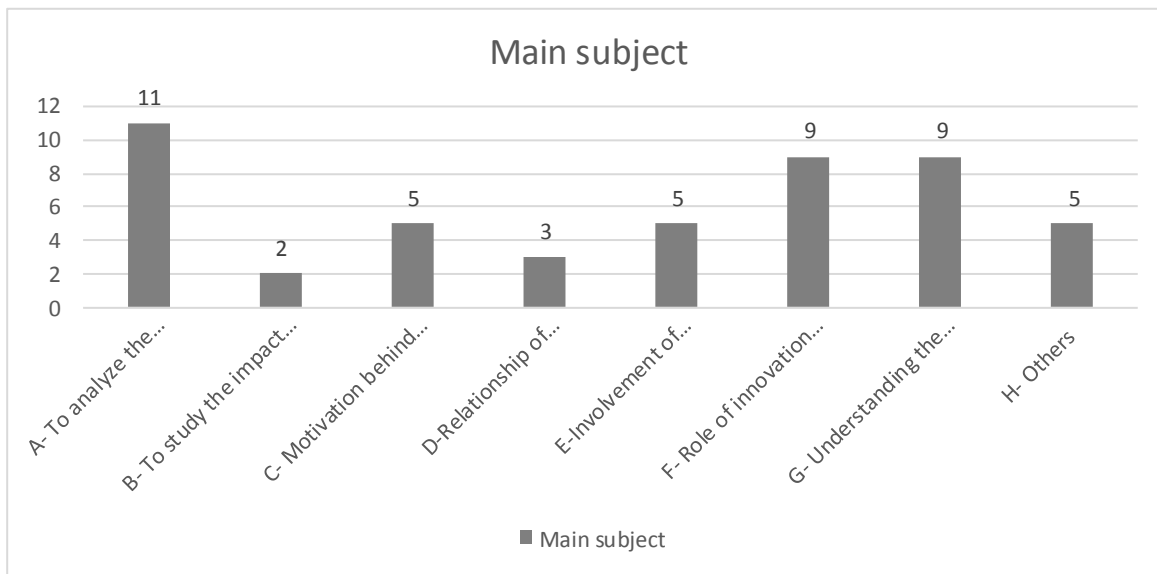


Research gap- The objective here clearly shows that the research done on gamification in education is what type of a research is it empirical , literature review, case study or the conceptual one. After reviewing and analyzing these 50 papers we came to a conclusion that mostly the study was conducted as an empirical study with total of 18 research papers and as conceptual with 17 research papers in total out of 50 and case study was considered as least adopted method with only 5 papers to study.

4.4 Main subject of research of research paper under

in this paper 8 different perspectives are considered which are-A-To analyze the factors that affects student engagement,B-To study the impact of social pressure on gamification.,C-Motivation behind gamification,D-Relationship of pleasure on student engagement, E-Involvement of emotions, fun and play in gamification,G-G-Role of innovation in gamification, Understanding the concept of gamification, H-Others.

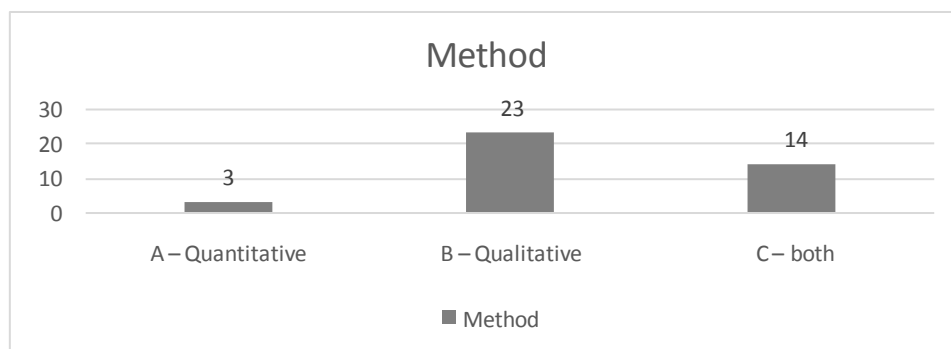
Figure 4



Research gap- The main subject which was studied the most in 50 research papers was To analyze the factors that affects student engagement with total of 11 papers on which this study was conducted and the least considered main subject was to study the impact of social pressure on gamification with only 2 papers.

4.5 Method: The last classification describes the result or outcome of article/papers reviewed. This classification tells that articles/ papers reviewed are of new perspective, or it is consistent with previous study or it is a comparative study. So, the codes are given from A- D, A-New perspective, B-Consistent with previous literature, C- Comparative study, D- Other

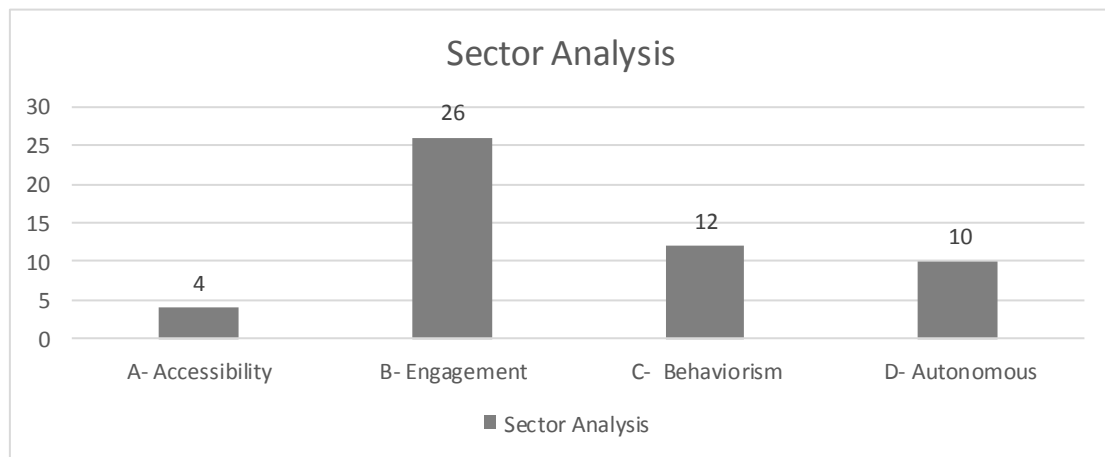
Figure 5



Research gap- In our study after the evaluation of papers we noted that mostly the study on gamification in education was done with the help of qualitative method as total of 23 research papers were founded who have adopted qualitative method and least of the study was done with the help of quantitative method with only 3 papers

4.6 Sector analysis- It explains about the area for which particularly researchers are writing about in this paper 4 sectors are considered i.e. Accessibility, Engagement, Behaviorism, Autonomous

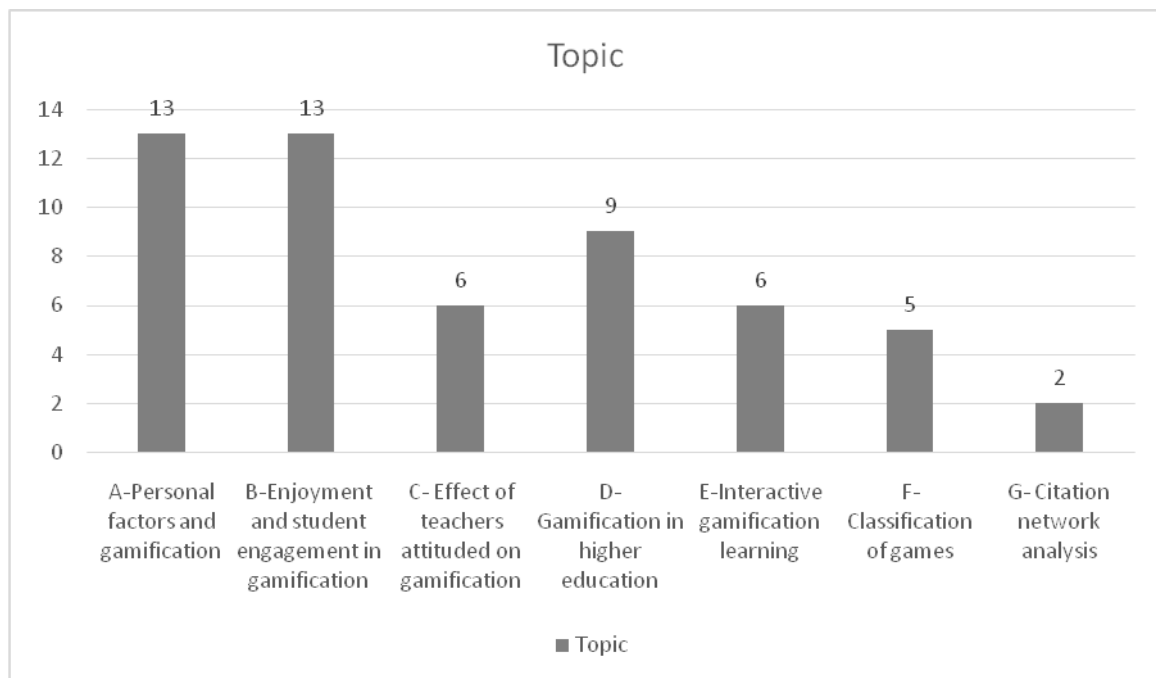
Figure 6



Research gap- In sector analysis the focus is laid on engagement of students in gamification in education as 26 total papers were found to be studying on the engagement of students and least focus is on accessibility with only 4 papers out of 50.

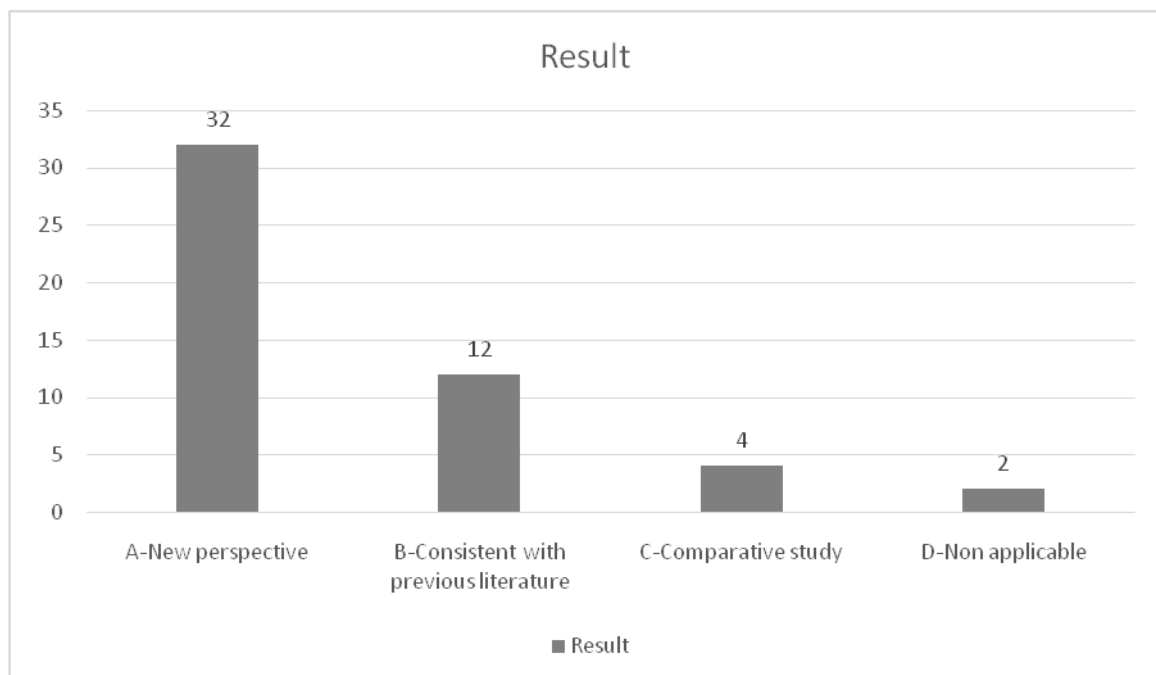
a. Topic here means the subhead of the main subject. In this paper few topics have been covered of gamification in education which are A-Personal factors and gamification, B- Enjoyment and student engagement in gamification, C-Effect of teachers attituded on gamification, D- Gamification in higher education, E-Interactive gamification learning. F- Classification of games, G- Citation network analysis

Figure 7



Research gap- It was found after reading 50 research papers that the topic which were highlighted the most were personal factors and gamification and Enjoyment and students engagement on gamification on which total of 13 research papers were found each out of 50 and citation network analysis was least considered with only 2 papers

4.8 Result-The last classification describes the result or outcome of article/papers reviewed. This classification tells that articles/ papers reviewed are of new perspective, or it is consistent with previous study or it is a comparative study. So, the codes are given from A-D, A-New perspective, B-Consistent with previous literature, C- Comparative study, D- Other



Research gap- Out of 50 research papers researchers came up with a new perspective in total 32 papers and if we see the above chart comparative study is not adopted which was only done in 4 papers.

5. CONCLUSION

As most of the research is done in developing countries mainly Europe. Majority of papers are based on empirical and conceptual study. Most of the studies are based on the factors that affects student engagement and qualitative methods are used by most of the researchers for conducting the study. So it is concluded that new perspectives are emerging in the area of studying the personal factors, enjoyment and engagement in gamification.

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