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# Examining the Role of Quizzing on Children's Curiosity

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**Abstract:** ***Thriving in today's world does not come as a ready recipe, however, individuals with an inclination towards new information, discovery, and problem solving are better equipped than the rest. In other words, curiosity is key! This research paper is aimed at measuring levels of curiosity amongst children and how they may be affected by competitive quizzing. A quiz was conducted as an experiment on children and 'pre' & 'post' data was collected from the same using a standardised curiosity assessment, Children's Curiosity Scale (CCS), developed by Dr. Rajiv Kumar. The collected data was used to understand the relationship between quizzing and curiosity. Data from the standardised scale showed no significant change in children's curiosity from before and after the single quizzing intervention. However, certain mechanics used in the quiz, such as the act of asking questions and use of visual media, show potential for stimulation of curiosity as backed by Berlyne (1954, 1955) and Arnone, et al. 's (2011). The implications of this study point toward ways in which traditional educational experiences can be modified to include references to curiosity that benefit educators and learners alike.***

**Keywords:** Curiosity, Quizzing, Children, Questions

## 1. Introduction

The world today is, arguably, changing at a more rapid rate than ever seen before in human history. Since the turn of the millennium, human perceptions of society, environment, technology, relationships, aspirations, entertainment, work, religion, and almost anything that matters, have been changing faster than the regular learner's capacity to keep up. Students, professionals, organisations, and families are all struggling to keep pace with change. Thriving in the volatile, uncertain, complex, and ambiguous (VUCA) world does not come with a ready recipe anymore and it is likely that 'the illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn' (Toffler, 1970). In such an environment, an affinity for new information, the desire to discover, and the courage to make agile decisions are invaluable qualities; or in other words, curiosity is key!

Generally defined by researchers in the field of psychology and cognition as the human brain's response to novel, complex, or ambiguous stimuli, curiosity has been researched using different and often interchangeable terminology such as explorative play, intrinsic motivation, reinforcement learning, neophilia, etc (Kidd and Hayden, 2015). More recent cognition-specific research on curiosity has proven that, when stimulated or induced, a curious mind retains information better, learns quicker, and even enjoys the entire process of acquiring information significantly more (Kang et al, 2009). Curiosity has been explained as a sensation initiated by the presentation of a question and also as the motivating force behind the desire to acquire new information by asking questions (Berlyne, 1954; Berlyne&Frommer, 1966). This research suggests a robust and highly complex relationship between questions, posed externally or developed internally, and curiosity.

One context in which the asking of questions takes centre stage is during a quiz. Whether conducted informally in a classroom as a revision exercise or more formally with set participants and spectators, the fundamental elements of a quiz are the questions themselves and a medium through which they are presented (most often a quizmaster). While quizzing can be linked to the development of multiple skills such as the ability to synthesise different types of information, work with a teammate, and solve problems methodically, the quiz's ability to spark interest in new topics and create a sense of awe/wonder among participants and spectators alike has not been explored as a manifestation of curiosity. This research project is aimed at addressing a knowledge-gap in existing literature and evaluating, using Dr. Rajiv Kumar's 'Children's Curiosity Scale' (CCS), whether or not a single competitive quizzing event would significantly impact curiosity levels in children.

## 2. Review of Literature

### 2.1. Curiosity

Among the many scientific researchers that have attempted to define and explore the topic, none maybe more significant than D.E. Berlyne. Berlyne's research, beginning in the early 1950s, can be seen as a reaction against the prevailing, behaviouristic theories explaining curiosity at the time. Best represented by the work of Pavlov (1927), early behaviourists explained curiosity in humans and animals as 'exploratory behaviours' and 'orienting reflexes' stemming from 'environmental variability' (Loewenstein, 1994). In order to define curiosity in a more comprehensive and inclusive manner, Berlyne (1954, 1960, 1966) suggested that curiosity is experienced in two variants; the first along a perceptual-epistemic axis and the second along a specific-diversive axis. The epistemic-perceptual variant identifies a curiosity related to gaining knowledge (epistemic), found exclusively in humans, and the exploratory behaviours exhibited by both humans and animals (perceptual) that behavioural psychologists termed 'curiosity'. The specific-

diversive variant of curiosity, on the other hand, distinguishes between the drive to seek out new information (specific) and a general boredom or openness to stimulation (diversive).

Some other existing theories on curiosity can be bundled together into a group that suggest curiosity is triggered by external motivations. First put forth by White (1959), his version proposed that curiosity stems from a fundamental competitive drive to achieve the highest possible level of proficiency in one's environment. Deci (1975) developed this idea further and attempted to create a robust relationship between competency and curiosity. Deci, however, interpreted curiosity to be a weak motivational state, secondary to physiological drives such as hunger and thirst. These extrinsic motivation theories stand in direct contrast to all research that defines and interprets curiosity to be a form of intrinsic motivation, i.e. the desire to perform an activity for its own sake rather than for some consequence that it may lead to.

Research from the 1950s and 60s explaining why humans and animals experience curiosity has been grouped into two main types - the drive theories and optimal arousal theories. Drive theorists like Harry Harlow (1950), Montgomery K (1952), and Berlyne himself (1954, 1955) interpreted curiosity to be an aversive state reduced by engaging in stimulating activities/behaviours. In contrast to the drive theorists, optimal arousal theorists like Hebb (1955) and Leuba (1955) interpreted curiosity to be a pleasurable experience when maintained at an optimum level. More recently, Litman&Jimerson (2004) and Litman (2005) built research upon the most significant difference evident in the accounts of drive and optimal-arousal theorists. Litman&Jimerson (2004) suggest that curiosity is a feature of both interest (I) and deprivation (D). As a result, their I/D model postulates that curiosity arises when there is potential for enjoyment or perception of a deficiency. Litman (2005) then integrated the I/D model of curiosity with a Wanting/Liking model that equates the neural systems of actively wanting and liking with varying states of deprivation and interest, respectively.

Another set of theories attempting to explain the cause of curiosity as a consequence of incongruities gained momentum through the 1960's and 70's. Hunt (1963, 1965) and Kagan (1972) suggested that 'curiosity reflects a natural human tendency to try to make sense of the world' and 'this need is not constant but is evoked by violated expectations' (Loewenstein, 1994). In general, these theories predict that curiosity is caused by a desire to dispel uncertainty from a situation and that individuals are often most curious about things that they do not understand or cannot explain. Building on the work of previous incongruity theorists, Loewenstein (1994) developed his information-gap theory and interpreted curiosity to be a 'reference-point phenomenon'; i.e., a sensation created by the perception of a gap between a certain reference point and the position of one's self in respect to that reference point. Put simply, Loewenstein proposes that curiosity is the product of a gap created by an individual's desired level of knowledge and their actual level of knowledge on a particular subject.

### 2.2 Questioning/ Inquiry

In his comprehensive manual on human thought and how to train the mind to 'think well', John Dewey (1910) identifies different thought habits that must be nurtured in young children. He suggests that, 'a higher stage of curiosity develops under the influence of social stimuli' during the *what/why* development stage of children that usually exhausts parents and educators. *Intellectual curiosity* is identifiedas the 'germ' behind exploratory questions and stimulation of the same germ is encouraged. One way in which the germ of intellectual curiosity can be stimulated, Dewey suggests, is by posing 'varied and subtle challenges to look further'. For Dewey, children asking questions, experiencing questions as stimuli, and entertaining a persistent independent passion for answers are more likely to harness curiosity as a 'positive intellectual force'.

Berlyne's (1954) extensive research on curiosity has also referenced questions and their role in bringing about curiosity. In the exposition of his drive theory on curiosity, Berlyne identifies the question as an initial 'thematic probe' that begins the sequence of events resulting in the sensation of curiosity. Berlyne predicted that the presentation of a question was perceived as a forked junction leading to either (1) a reduction in curiosity drive by recall of the answer, or (2) an in-satiation of the curiosity drive and subsequent trial-and-error method of finding out the answer. In later research, Berlyne&Frommer (1966) provide evidence that a questioning attitude has been long since considered an indication of curiosity. They interpret the asking of questions as an epistemic behaviour directed at the acquisition of knowledge and motivated by epistemic curiosity.

A significant portion of pedagogical research has been directed towards the role of questions, posed to students and coming from students, in the classroom. One such pedagogy is the Inquiry Cycle (Casey, 2014); Casey proposes a model in which questions initiate the sequential process of learning and sustain it at every incremental stage by building curiosity. Interestingly, Casey avoids limiting the question to just a sentence ending with a question mark, instead choosing to explain and show value in creating what he terms a 'question situation'. Questions and their benefits in the classroom have also been explained by Musingafi& Maxwell (2014). Their article identifies the benefits of questions asked by teachers and examines, using existing research, the value of student generated questions in learning situations.

### 2.3 Quizzing

Quizzing as defined by Merriam Webster dictionary is 'a form of entertainment' wherein members 'compete in answering questions'. There are different methods of quizzing, most traditional is the competitive form where individuals or teams of individuals compete in answering questions set by the quiz master. Over the years, there have been many papers published around quizzing, importantly, on its role in academics. Zijlstra et al's (2015) study in the Netherlands around quizzing and academic performance concludes that there is a causal relationship between online

quizzing and learning performance of individuals in higher education. Where learning performance implies the act of 'learning of a behaviour or skill' versus 'performing' it.

Urtel, Bahamonde, Mikesky, Udry& Vessels' (2006) study has concluded that online quizzing leads to an increase in academic performance, student engagement, and perception. The undergraduate students who took part in this study were given tasks of completing quizzes based on their readings in class. It was observed that students who took part in the online quizzing achieved better grades than the control group which did not. Licorish, Owen, Daniel & George (2018) studied gamification in quizzing, specifically Kahoot![1]. Their study observed and tracked dimensions such as classroom dynamics, engagement, motivation, and improved learning experience. The study has concluded an increase in students performance is directly correlated to an increase in the observed dimensions.

### 2.4 Games/Activity and Media

Independently or combined, gamified activities and media play a significant role in maximising engagement. The Tekkumru-Kisa& Stein (2017) study discusses the importance of purposefully curating curriculum based on the objectives and goals of a session and how this affects results. Their research also highlights the growing role of technology in contemporary learning and how educators can leverage the same concepts. Existing research from Jacobs et al.'s (2017) points to the crucial role of media-heavy educational content in productive self-reflection while Arnone, et al.'s (2011) work emphasises the role of media in inducing or stimulating curiosity. Arnone, et al.'s research employed a unique form of methodology involving the creation of specific timelines to understand the relationship between curiosity and media[2].

Examined vice-versa, curiosity has been proven to be a key component of gaming experiences and player engagement. Lazarro's (2004) Four Keys of Fun model distinguishes 'easy fun' as a type of fun elicited by curiosity heightening experiences such as exlopration, creativity, and fantasy. Origlia, Chiacchio, Maurio&Cutugno's (2016) claim that "Under Juul's (2010) definition of games as having 'variable and quantifiable outcomes,' the uncertainty of how a game will turn out is in fact a critical part of what makes a game a game in the first place. Curiosity, then, lies deep at the heart of play." These conclusions align with curiosity focused research that suggests the sensation surfaces in response to situations of uncertainty.

Educational games according to Royle&Cofler (2010) are designed with specific curriculum objectives and predetermined outcomes. While elaborating on how educational games can be developed with clear goals and outcomes, As'ari et al.'s (2013) study comments that games are tools for recreation and also 'can be played as learning facilities to develop a child's curiosity.' Examples for such games available in the contemporary digital era are 'Can You Escape - Tower 2', 'Brain Games for Kids', 'Mind Games' and 'Peak' [3].

## 3. Methodology

### 3.1. Research problem

Can curiosity be increased through traditional competitive quizzing?

### 3.2. Objectives

To understand if Quizzing is a pathway to enhance Curiosity

### 3.3. Operational Definitions

Curiosity: An elementary school child is said to demonstrate curiosity when he (1) reacts positively to new, strange, incongruous, or mysterious elements in his environment by moving towards them, by exploring them, or by manipulating them; (2) exhibits a need or desire to know more about himself and/or his environment; (3) scans his surroundings seeking new experiences; (4) persists in examining and/or exploring stimuli in order to know more about them[4].

Quizzing: An activity in which the general or specific knowledge of the players is tested by a series of questions. The activity is conducted as a competition [5].

### 3.4. Research Design

An experiment was conducted to fulfill the project's objective. Pre and post data was collected using a standardised questionnaire (CCS). Qualitative data was collected from individual adults who observed the experiment.

**Experiment:** Children (of different age, gender, educational board, and school) responded to the CCS and then took part in a standard, competitive quiz. 13 teams of 2 participated in the written preliminary round which consisted of 20 questions created using audio, visuals, and text (regular questions); the correct answers were discussed with the children prior to a break for refreshments.

The 6 highest scoring teams from the preliminary round were invited to participate in the finals. The finals consisted of 2 rounds of regular questions, a round of 'Connect'[6] questions, and a 'buzzer'[7] round. Prizes were given away to the top 3 finishers. One week later, the CCS was administered on the quiz participants again.

### 3.5. Hypothesis

Following the objective and empirical studies conducted, the following hypotheses were formulated:

1) Quizzing as a single intervention does not increase curiosity.
2) Mechanics used in Quizzing stimulate curiosity.

### 3.6. Variables

1) Independent variables: Quizzing
2) Dependent Variables: Curiosity

3) Extraneous Variables: Content

### 3.7 Inclusion Criteria

1) Children of age 9-14 years
2) Education between class 4th-8th
3) Gender - both males and females
4) Children who have been part of classroom quizzing

### 3.8. Exclusion Criteria

1) Children who have not had a formal education
2) Non english speaking children[8]

### 3.9. Tools

The tool used for the purpose of the study was the Children's Curiosity Scale (CCS) developed by Dr Rajiv Kumar. CCS is a 41-question multiple-choice self-reporting inventory, it is used as an instrument for measuring curiosity. The questionnaire is designed for individuals aged between 9 and 14.

### 3.10. Ethical Considerations and Permissions

Children participating in the experiment were not harmed either physically or mentally. Permissions were acquired from parents and they were given consent forms and it was explained to the participants that they can leave the study at any given point of the experiment.

### 3.11. Procedure

26 children of age 9-14 participated in this experiment with parents' consent. It was conducted in an enclosed space at the club house of a residential community in Bangalore. The total duration of the experiment was 150 minutes including a 15 minute refreshment break. The experiment began with participants completing the Children's Curiosity Scale (CCS) test ('pre' data collection). The intervention that followed was a standard quiz involving a quizmaster, questions projected onto a screen, and a preliminary round before the final. As the quiz was a team competition, children were paired together at random. The participants were also informed that they could leave the intervention at any given point. Prizes were given away for 1st, 2nd, and 3rd place. 7 adults observing the quiz were part of the qualitative data collection through semi-structured interviews. The qualitative data contributors were briefed about the experiment and research project after their respective interviews. The participants of the quiz were invited back to the same venue one week later to take the CCS again ('post' data collection). 'Pre' and 'post' data were then scored and interpreted.

### 3.12. Precautions

1) The experimenter made sure that the subjects understood the various instructions.
2) The subjects had to respond to all the questions on the Children's Curiosity Scale.
3) The experiment was conducted in a conducive environment.

## 4. Results

The Children's Curiosity Scale, or CCS (English version), by Dr Rajiv Kumar was administered to a group of 26 students between the ages of 9-14 who are studying between grades 4th to 9th in different schools across Bangalore. The scale was administered twice, once (pre) before the competitive quizzing intervention and once (post) one week after the intervention. The CCS contains a set of 44 questions for 9-14 year old children to respond to, it calculates the curiosity level of the individual.

There were 53.85% males and 46.15% females in the purposively selected sample set for the intervention (Table-1). The calculations in Table-2 show that the mean for the group scores before the intervention was 100.38 and one week after the intervention was 102.19. The slight increase in the scores might be indicative that quizzing as an intervention played a factor in the level of curiosity increasing, but not at a significant level ($p>0.05$). The standard deviation between the scores was 16.80 and 19.88 for pre and post scores, respectively.

**Table 1:** Represents distribution of males and females

| | Male | Female |
|---|---|---|
| Subjects | 53.85% | 46.15% |

**Table 2:** Represents subjects' scores on the CCS

| | Scores before intervention | Scores after intervention |
|---|---|---|
| Total | 2610 | 2657 |
| Mean | 100.38 | 102.19 |
| Stand Deviation | 16.80 | 19.88 |
| t value | 0.544* | |

* Not significantly different, as $p>0.5$

From Table -3, the mean of males before the intervention is 104.43, while for females it is 95.67. Similarly, for post scores, while males have a mean of 105.86, females have a mean of 97.92. This indicates that there is a small increase in the curiosity level before and after the intervention, though not significant. The level of boys' curiosity is more than that of girls for this sample set and there is no significant difference between the pre and post scores of each group. The standard deviation in the pre and post scores of males is comparatively larger than that of females' pre and post scores.

**Table 3:** Represents group scores of genders and calculations of subjects scores on the CCS

| Sex | N | Mean Pre | Mean Post | SD Pre | SD Post | t value remarks |
|---|---|---|---|---|---|---|
| Males | 14 | 104.43 | 105.86 | 17.99 | 23.31 | No significant difference |
| Females | 12 | 95.67 | 97.92 | 14.62 | 14.81 | No significant difference |

## 5. Discussions

There are one of two patterns in the pre and post scores from Table -4 (appendix). Sometimes individual children's scores have remained similar before and after the intervention with only differences in one, two or three points, either negatively

or positively. For Example, the individual subject '1' had scored 85 in the pre and in the post had scored 87. A few children have deflected from the pre scores extremely to either positive or negative. Like for example, subject '22', from 90, she has gone up to 117 or subject '2' who from 110, has scores decreased to 97. There are large differences that are not accounted for, but the researchers can hypothesise for large positive increments to be due to sudden curiosity inducing event the child experience before taking the post test, and similarly for negative scores, due to personal state of being at the moment of taking the test, whether tired after a long day or not interested to take the test again.

The researchers hypothesize that if the 'post' data collection was done immediately after the completion of the intervention, curiosity scores would have significantly increased versus collecting data a week after the intervention. The researchers also hypothesize that if the 'post' data was collected two weeks after the intervention, results would reflect lower average scores. These suggestions are in line with Loewenstein's (1994) study where curiosity as a function is considered more temporary than long-lasting or permanent [9]. Seen through this lense, the cultivation of quizzing as a practice may show more benefits over extended periods of time.

Many daily-life situations present individuals with moments of ambiguity, however, not all demand an immediate response from the experiencer. As opposed to polar questions whose potential answers are only 'yes' or 'no', a quiz question demands individual thought and a non-binary response. This is ensured by the quiz's competitive nature and the participants desire to win. Each question then, interpreted as the most common 'thematic probe', undeniably stimulates and sustains curiosity in participants until it has been answered (Berlyne, 1954). Identifying that there is a small increase in curiosity scores in subjects (though not significant), researchers assess that it could be due to three mechanics employed in quizzing; these are - the usage of novel questions, media, and the concept of gamification.

While questions are often thought to be, especially in a quiz, one-dimensional statements ending with a question mark, this is not always the case. The modern quiz's infrastructure allows for the presentation of questions in novel ways; one example being, the non-verbal 'connect' format. This type of question not only presents an ambiguity by requiring an answer, it also presents ambiguity in an uncommon way - through the use of exclusively visual clues. A challenge presented in this manner can then be considered to initiate curiosity from two dimensions - the ambiguous and the novel (Kidd and Hayden, 2015).

Visual media like images and videos were used in two contexts while the quiz was being conducted, during question presentation and during answer reveal. The media visibly kept participants 'engaged' during the course of the activity. As most of the subjects were of ages 9-14 years, which recent statistics show as the age when children are given technology like tablets and mobile phones to interact with, their visual IQ would be comparatively higher than the older generation. This implies that young subjects receive and respond to the media in highly significant ways. Referencing Arnone, et al.'s (2011) research, it can be justified that the various forms of media employed during the quiz played a role in inducing curiosity.

The intervention was approached by subjects as a 'game' and motivation for participating in the quiz was fun and recreation. The competitive nature of the quiz resulted in the participants' heightened engagement with the quiz material. During the course of the intervention, participants and observers have reported 'learning' taking place as well as development of 'interest in new topics and subjects'. Gamification, inherently present in a quiz, can be assessed as a curiosity stimulator (As'ari et al., 2013).

Qualitative data was collected via semi structured questions from 7 adults observing the intervention. The data was collected to gather information regarding the observers' understanding of and opinions on competitive quizzing. 5 out of 7 individuals described quizzing as an event which makes children 'think'. 4 commented that quizzing is an 'information gathering/rich' event. All 7 observed that quizzing makes children get 'involved' in the activity. All 7 also concluded that they see a correlation between quizzing and curiosity as quizzing "has the element of asking questions which prompts participants towards actively finding a solution - stimulates curiosity". These findings are in line with Berlyne's study (1954) of questions initiating the sensation of curiosity.

Observers noted that while the quiz was being conducted, children actively 'enjoyed' the process of guessing answers to questions. Observers have also reported that they were "curious to find out answers" for questions they could not answer directly. Some also reported that they 'googled' a few questions whose answers they were not aware of or were interested in, for example, 'jordindian' and 'instruments made of ice' [10]. All 7 have expressed an interest to participate in quizzing. This is parallel evidence to Dewey's study (1910) where he suggested 'a higher stage of curiosity develops under the influence of social stimuli'; in this context, stimuli refer to the quiz environment as well as 'interesting topics/answers'. These findings suggest that the observers during the intervention also experience 'curiosity'.

## 6. Limitations

1) Sample size used was relatively small.
2) The mechanics of quizzing were not quantitatively accounted for in the study.
3) The quantitative data was collected as a self-report. There is a possibility of the subjects responding to the questionnaire with socially desirable answers.

## 7. Conclusion

Major findings show that there is no significant impact created by competitive quizzing on children's curiosity, thereby proving hypothesis one. The data, however, does show a slight increase in curiosity scores of the subjects. Reviewed literature has suggested that the mechanics used in quizzing such as asking questions, giving clues, employing

visual aid and other media play a factor in stimulating children's curiosity, thereby proving hypothesis two. While quizzing conducted as an isolated intervention is not seen to have a significant impact on curiosity, developing quizzing as a habit or practice is likely to show otherwise. Moreover, quizzing, conducted routinely as a learning exercise rather than a sporadic event, and using mechanics like questioning, media, gamification, and facilitation, we predict, may prove influential in stimulating children's curiosity.

## 8. Implications of the Study

Incorporating references to children's curiosity, more specifically experiences that make children curious and also allow children to express innate curiosity, can enhance the way children learn on a day-to-day basis.

The most common usage of the quiz in today's classroom is as a method of evaluation but studies suggests quiz has more potential than as a plainly evaluative practice:

1) Quiz as a tool or device can increase learning efficiency and also engagement/participation in classroom settings. Building an educative curriculum around quiz and its mechanics can make learning more fun, approachable, relatable, and interactive.
2) Quiz mechanics analyzed in this study continue to have value outside the quiz context. One example is the use of questions in a classroom and the potential they have for anchoring and driving discussions, curiosity, and learning.
3) Quiz can be a modern method of pedagogy for children to be prepared for the requirements of a 21st century citizen. Enabling the future generation with tools for independent thinking, problem solving, decision making, and teamwork amongst others.

## 9. Suggestions for Further Research

1) Recommend conducting a similar experiment focused on the curiosity scores of siblings to see the effect of home environment on curiosity.
2) Recommend conducting a study aimed to measure correlation between school-curriculum based quizzing and children's academic performance in Indian context.
3) Recommend conducting a quantitative study of mechanics of quizzing and its effect on curiosity with a larger sample.
4) Recommend conducting similar research using curiosity assessment scale with different operational definition of curiosity.

## 10. Acknowledgments

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## 12. Conflict of Interest

The research paper was funded by Walnut Knowledge Solutions.

## 13. Endnotes

1) This is a form of online quizzing where each question has two-four-six-eight multiple choice answers.
2) Refer: As'ari,Fajar; Yunanto, SH &Nugroho, EW (2013). Educational Game as Way to Help Child's Curiosity.
3) Digital apps/games available for children of age 9-14 on PLAY store of android phones. These games often have colourful images and are very engaging. Some games have small quizzes, questions, and other challenges that players have to answer/pass in order to level up or proceed in the game.
4) The Children's Curiosity Scale was developed based on the definition of curiosity in *Maw, W.H., & Maw, E.W. (1964). An Exploratory Study into the Measurement of Curiosity in Elementary School Children (CRP No. 801). Newark: University of Delaware*
5) Defined by the investigators referring to 'Colin's' dictionary
6) Multiple images shown on a single slide with the common theme as the answer
7) Round of questions in which the first team to illuminate their buzzer is given the chance to answer
8) For the purpose of the standardisedEnglish language used for quizzing and in the questionnaire.
9) Post data was not collected immediately after the quiz because the duration between pre and post would have been less than 4 hours. It was concluded that the experience of taking the scale once before would alter the post scores significantly if taken again within such a short duration. There was also no suggestion of how to use the scale as a pre and post questionnaire and the safe duration of gap between administering it twice on the same sample; hence, following standard procedure, it was administered a week after administration of the pre test.
10) These questions were part of the competitive quizzing curriculum

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## Appendix

**Table 4:** Represents scores of subjects on the Children's Curiosity Scale (CCS)

| | | | Standard Score | |
|---|---|---|---|---|
| **Participants** | **Gender** | **Age** | **Pre** | **Post** |
| 1 | F | 12 | 85 | 87 |
| 2 | F | 13 | 110 | 97 |
| 3 | F | 14 | 110 | 112 |
| 4 | F | 14 | 112 | 95 |
| 5 | M | 14 | 100 | 90 |
| 6 | M | 14 | 122 | 75 |
| 7 | M | 11 | 100 | 122 |
| 8 | F | 14 | 72 | 75 |
| 9 | M | 11 | 102 | 92 |
| 10 | M | 14 | 132 | 127 |
| 11 | M | 14 | 105 | 110 |
| 12 | M | 11 | 115 | 137 |
| 13 | M | 13 | 87 | 85 |
| 14 | F | 14 | 85 | 95 |
| 15 | F | 14 | 95 | 95 |
| 16 | F | 13 | 122 | 127 |
| 17 | F | 12 | 90 | 100 |
| 18 | F | 12 | 92 | 95 |
| 19 | M | 12 | 120 | 135 |
| 20 | M | 11 | 80 | 77 |
| 21 | M | 12 | 90 | 112 |
| 22 | M | 10 | 75 | 75 |
| 23 | F | 10 | 90 | 117 |
| 24 | M | 9 | 102 | 110 |
| 25 | M | 9 | 132 | 135 |
| 26 | F | 10 | 85 | 80 |