Exploring Factors of Statistics Anxiety among Students via Photovoice Approach

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Many research has looked into mathematics anxiety, but not many have gone specifically into statistics anxiety. The purpose of this study is to determine the factors of statistics anxiety based on behaviour and speech of teachers and peers from the perspective of students in Johore, Malaysia. A questionnaire regarding statistics anxiety was distributed to 125 students from one school and 10 of the most statistics anxious students were selected to participate in the Photovoice project. Photovoice is a data gathering technique where participants are asked to capture photos about areas of concern and, in this regard, teacher and peer behaviour and speech that cause them statistics anxiety. These photos are then dissected in the interview session. The findings revealed that teachers can cause statistics anxiety through their behaviour by giving less attention, pressure, many statistics exercises and notes and over speeding. They can induce statistics anxiety through speech by giving discouraging and terrifying statements, embarrassing students, giving too many warnings and using inconsistent voice. Meanwhile, peers can also induce statistics anxiety through inappropriate actions, such as walking around, pulling chairs and taking other people's books while others are studying. This includes the speech, such as being discouraging and terrifying in giving statements, distracting attention and making embarrassing statements. This research recommends that teachers, peers and educational institutions need to make some changes in order to improve students' statistics anxiety.

Keywords: Statistics anxiety, Mathematics anxiety, Secondary students, Photovoice approach

Mathematical Games of Dice: A Research Based on Calculations of Computer

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In the game that is studied in the previous research of the authors, players throw dice with varieties of faces, and the winner is the player whose sum of the dice she/he throws is higher than that of any other player. It is found that if player α with three standard dice plays against player β with a 20-faced die in a two-player game, the probability of winning is the same for each. Conversely, the player with the 20-faced die has a better chance of winning when the number of players participating in the game is greater than two. In this talk, the authors study a new game in which each player has her/his points. The game consists of a certain number of rounds. In each round, they throw dice, and the winner is the player whose sum of the dice she/he throws is higher than that of any other player. The points of each player except the winner will be reduced by one point. Then, the next round will begin. When the number of points of a player becomes zero, she/he will be dropped out of the game. The game continues until only one player remains. Our research is based on the calculation of computers, but there are two types of calculations of computers in mathematical science. In the present research, we use random numbers produced by computers. Therefore it is different from the exact calculation of probability by checking all the cases. The authors used computer algebra system Mathematica mainly, but they also use Python to compare the result of Mathematica. This research is carried out by a mathematician, junior and high school students, and college students.

Keywords: Mathematica, Computer algebra system, Python, n-faced dice, Probability theory, Sum of dice