The Game MathScrabble

Description of the game

It is a Board game that can be played around a table or similar arrangement (even on the floor) on which we place the Board

In the game we can have 2 to 4 players and their goal is to get as many points as possible by placing on the Board tiles that score according to

1. What symbol they represent, and
2. Where on the Board they are placed

It is a game very similar to the word game scrabble, where the object is to construct a word using tiles representing letters. In the MathScrabble case the object is to construct equalities using tiles representing mathematical symbols.

Clearly this analogy is in line with what we call in the Philosophy of Education the Realm of Symbolics. There the natural language and mathematics are constituents and reflect their meaning as tools for communication.

How do people play scrabble?

Example – Video of playing Scrabble

Now for MathSrabble

The game can be found in the market under many names and variations, although the basic idea is always the same.

Example – Video of playing Scrabble

Now in our case:

Question 1: What are the basic tools

You can find answers in The Compendium and in the Guidebook of the project

A 15X15 Board with cells where the tiles are going to be placed and where some of these have some special meaning, reflecting in the scoring process.

Question 1: What are the basic tools

Tiles in a bag representing mathematical digits or symbols

Question 2: What are the rules and what is the goal of the game? How do we play the game?

Question 3: What mathematical concepts/ processes or ideas/ human skills or abilities are involved in the game?

Concepts: The set of the integers, their operations, the concept of equality in the set of integers, coordinates, geometrical figures …

Processes/ skills: the properties of the operations, the properties of equalities, the priority of operations, calculating, problem solving, communication, critical thinking (analysis and comprehension), assessment and evaluation, risk analysis, presentation, strategic thinking, designing, creating or constructing tools….

Question 4: Obviously in the context of the present project we face again the issue:

To what extent does the MathScrabble can help in providing answers to the basic 5 questions we find in the Compendium ?

1. How can we reduce the number of under skilled adults to promote social integration and participation into our society?
2. How can we increase incentives for adult training by using games?
3. How can we offer tailored learning opportunities to individual learners by using games?
4. How can we provide information on accessing to the services of adult learning?
5. How can we save traditional and famous games in different countries from being lost?

Which really leads to the basic issue

HOW DO WE DESIGN A LESSON THAT LEADS TO ANSWERING THESE ISSUES?

Expected Benefits from games in the process of learning mathematics

**Creating Interest and Promoting Motivation**  
**Utilizing the Benefits That Games Provide in Engaging Learners in an Environment of Experiential and Active Learning**  
**Socializing the Persons Involved and Exploiting the Competition and Challenge Element**  
**Connecting to Real Life Situations**.

**Developing a Happy and Joyful Environment**.

**Utilizing the Design (Structure, Rules, Equipment, Problem Posing etc.) of a Game in Order to Develop an Appropriate Learning Approach**

In designing a lesson and in view of the goal for achieving the optimum number of benefits of using a game (as presented in the Guidebook) I believe that the following aspects are guiding principles:

The **Background** (cognitive as well as affective) of the students that are going to attend the activities to be included in the playing process.

The **General as well as the Special objectives** that we set in the context of the game.

The **mathematical content** that is part of the playing activity.

The approach or **methodology** that we want to adopt for using these activities (as presented in the Guidebook) (Is it just an introduction to develop interest? Is it an opportunity for consolidation?...)

The Spiral or step by step structure we are going to adopt in order to secure gradual involvement of the learners, both for understanding the rules of the game as well as for developing mathematical skills

The lessons presented in the Guidebook are designed in the spirit of these observations

We take it for granted that we have facilitate the learning process in mathematics for slow adult learners with poor mathematical background because of

1. Poor opportunities during their juvenile ages, or
2. Special needs, or
3. Difficulties arising from other reasons (eg language they speak, racial discrimination, etc )

The Objectives set (see The Guidebook page 57) cover a broad spectrum. All of these are not expected to be covered in every lesson, but some of them in each of these opportunities

Another important aspect that can help the learner to become aware of the basic constituents of the game (Guidebook pages 58-60) is the support and guidance for designing and constructing the tools of the game, i.e

The Board (thus learning about geometrical figures and measurement)

The tiles and racks for placing them during the game.

The Cards with the rules of the game (thus having to comprehend what is involved in the game)

The Scoring Sheets.

The lessons (in the Guidebook pages 61-72) provide the following structure

Getting acquainted with basic mathematical concepts used in MathScrabble

Constructing Equalities using the MathScrabble Symbols

Constructing Equalities and Placing them on the Board Using the Symbols

Constructing Equalities, Placing them on the Board and Calculating the Score Corresponding to them, According to the MathScrabble Rules

Workshop

I would like you to go over these lessons, study them, review the worksheets, present your comments for discussion and propose possible redesigns of the structure

EXTENSIONS

But certainly it is easy to find out that MathScrabble can be used not only for slow adult learners but also in analogous situations dealing with children (from the age of 8 and above), with students at the university level and with researchers in very advanced fields.

ASSESSMENT

What advantages does the game offers in the process of learning mathematics.

Obviously it provides the forum for

Learning to manipulate integers through recreation

Comprehension of formalities we have adopted as rules of communication (eg the should realize that such a relation 2X3+5=16 is wrong)

Competition

How do we design a Lesson

What is problem solving

What happens if the available to the players tiles are not possible to form an equality and the players cannot proceed?

It is an opportunity to talk about Arrow’s impossibility theorem.

What digital means can we use

Calculators, laptops (e.g EXCEL)

Objectives of the game

For adults with limited background in mathematics

(designing the tools of the game, preparing tables for calculations, comprehending various concepts/ processes in mathematics)

To what extent

General objectives

Specific objectives

Approaches of using it

How to design and build/ construct its tools

What material can be accessed through the webpage of the project

References

Extensions

Simulation of playing it

Lesson Plans as presented in the Guidelines for teachers - practice by the participants

Simulation of playing it

2 players playing

Round 1

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Player 1 |  |  |  |  |  |  |  |  |  |
| Player 2 |  |  |  |  |  |  |  |  |  |