

# Increasing the Inducement if the Scholars to Analyze Arithmetic

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## ABSTRACT

The students use computers, smartphones and different digital gadgets regular for their very own wishes. The achievement in mathematics is getting lower and decrease, each on local level in Macedonia and on international stage also [6]. loads of the scholars are having difficulties with mastering arithmetic, and with that also the motivation for getting to know mathematics decreases. The difficulties are proven in each, getting to know the cloth in school and fixing the sporting activities at domestic. additionally, while the scholars clear up actual-life issues, they're not connecting what turned into found out on mathematics classes with those troubles. They almost do not use the mathematics and the digital devices at all for solving the actual-lifestyles troubles. If we reach encouraging the scholars in using these electronical devices and softwares for: examining, investigating, visualizing and fixing actual-life troubles, we can get college students which can be encouraged for studying mathematics, and with that still we are able to get improved level of know-how of mathematics. in this mission, for increasing the motivation for studying arithmetic and increasing the extent of know-how, we made a web utility <http://mathlabyrinth.azurewebsites.internet> The troubles which are put on the internet utility are related with real-existence problems the students have, who want understanding from secondary training arithmetic to remedy them.

**Keywords:** Arithmetic, Motivation, Internet Utility, Exercise, IT.

## I. INTRODUCTION

In several today's researches that have been completed in our u . s . a . , and wider, it has been hooked up that the understanding in arithmetic and the scholars' motivation for studying arithmetic are decreased and they're underneath the minimal stage of expertise. therefore, one of the priorities of our u . s . a . and wider in the discipline of schooling is to inspire the pupils to study arithmetic and to growth the extent of understanding within the identical difficulty with the scholars of every age. how to growth the extent of knowledge in arithmetic and a way to increase the inducement for analyzing arithmetic?

because the students use computers, smart phones and other electronic gadgets for his or her desires increasingly, there's a need to contain them in the training and within the analyzing of mathematics. The loose software program (GeoGebra) is used within the

teaching, which is used to remedy and visualize the constructive physical activities [1], physical activities with functions, sports from aircraft geometry and stable geometry, physical activities with opportunity [7] and others. the usage of the software program magnificence marker there were made digital tests to check the pupils' expertise [2], which might be pretty positively regular through them. however, IT is not used enough within the coaching and it's miles still important to paintings on raising the pupils' motivation and their degree of expertise. with the intention to establish the advantages of the usage of the internet utility in coaching mathematics and growing the motivation, and through doing that increasing the information in arithmetic too, two surveys were made with the students of the gymnasium "Kocho Racin" from Veles. One earlier than starting with the use of the internet software in the coaching of mathematics, and the other after twelve months usage of the internet software. 146 pupils participated within the first survey. The accent of this

survey is put on fixing textual physical activities wherein the troubles of the real life are elaborated, the usage of the IT whilst fixing them, fixing the sporting activities in domestic conditions (home work) and motivation for analyzing mathematics [3]. some of the questions from the first survey, earlier than starting with the usage of the mission and given answers:

- To the question “Do you suspect that you may growth the motivation for reading arithmetic by using fixing sensible exercises” sixty seven% of the students requested replied that continually or often they may be encouraged to have a look at arithmetic.

Do you think that you may boom the motivation for analyzing arithmetic by fixing sensible exercises.

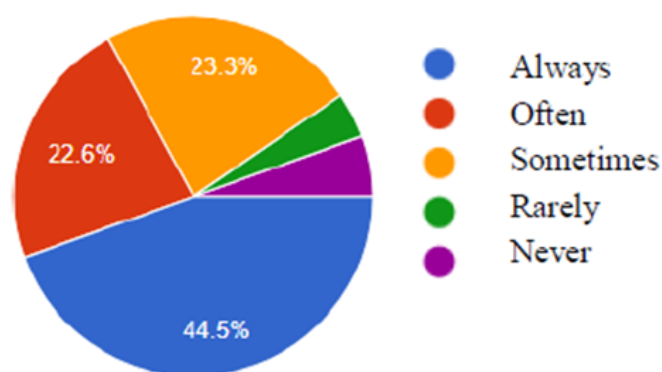


Table 1.

To the query “when you have issues whilst doing your homework, could you want to have a web website online so as to come up with the steps and assist for troubles solving” 86% of the requested scholars said that they want and only 5 % that they do not need to have that type of assist. if you have issues even as doing your homework, might you want to have an internet web page with the intention to come up with the stairs and help for troubles solving.

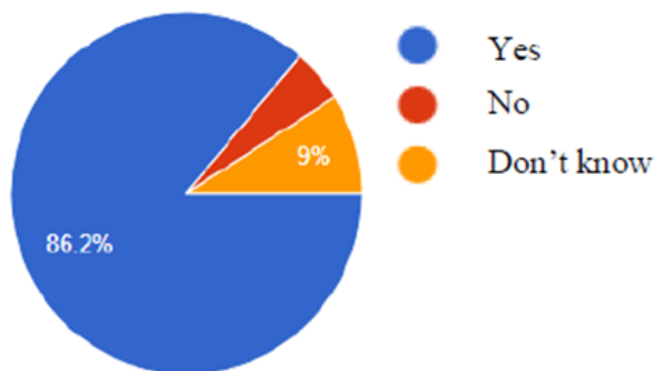


Table 2.

Summing up the outcomes of this survey justified the beginning of creating the internet software <http://mathlabyrinth.azurewebsites.net> [4] on which the sports associated with the real issues are supplied, the technique for his or her fixing and visualization and then its utilization inside the coaching and also while doing the homework. The net utility is unfastened and it can be used with prior registration.

## II. METHODOLOGY FOR MAKING TEXTUAL PHYSICAL ACTIVITIES FROM THE INTERNET APPLICATION

Before beginning to make the net software it become vital to choose the sporting activities and a system for their solving. The physical games which can be supplied on the web site are from the text books which are used in our u . s . or at the global checks and are related to everyday issues which the scholars can encounter. The physical activities are grouped through themes (Figure 1).

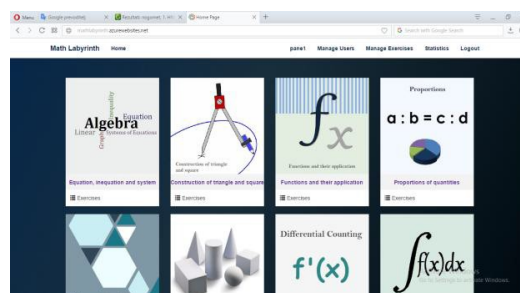


Figure 1. Home page – Themes

whilst determining the process for sporting events solving, knowing that they will be solved at some point of lesson and in home conditions, a system primarily based on Pólya offered in the e-book “the way to clear up” has been used [5]. The procedure is based totally on 4 principles and they're:

- First, expertise the hassle
- After knowledge you make a plan for solving,
- Implementation of the plan,
- To study the technique and the trouble solving. Can it's advanced and the way?

The first precept - knowledge the trouble “understanding the problem” is often neglected, as if it is apparent, so it even isn't referred to during the mathematics classes. but, the pupils are often stuck in this step, after they want to clear up the exercising alone, simply due to the

fact they don't completely understand the given problem. so as to restore this sight, Pólya gives the commands how the academics can inspire the scholars, with appropriate questions, relying at the state of affairs, which include: What wishes to be located or proven? can you repeat the trouble for your own words? Can you make a drawing or a diagram so that it will assist you understanding the trouble? Do you understand all of the phrases which can be used inside the hassle presentation? as a consequence, at the beginning of the exercise, that is provided at the net website online, the teacher chooses couple questions with suitable degree of difficulty depending at the age of the pupils, so as to understand the exercising and to recognize what desires to be calculated. the second one principle – make a plan according to Pólya it's far been stated that there are many reasonable approaches for problems solving. The ability of choosing the suitable approach can be leant satisfactory by fixing many issues and this should be highlighted to the scholars. Partial listing of techniques is: bet and test, removal of opportunities, use symmetry, think of different instances, use direct questioning, remedy equations. A concrete list of strategies is: search for a version, drawing a Figure, use a formula, be creative, use skills and so forth. in the process of choosing the plan and the process for solving the exercising it's far used free software for visualisation of the problems and presentation of different strategies for his or her solving. it is usually cited that that is one of the techniques for solving the workout , that with the pupils' creativity the exercise may be solved otherwise and plenty faster. The 0.33 principle – Implementation of the plan This step is normally simpler than making the plan. In truth, all you want is care and staying power, thinking about that they've the needed abilities. They have to retain with the selected plan. the writer of this step mentions that: if it doesn't work, throw it away and choose another plan. Don't idiot your self; that is the principle how the arithmetic is achieved, even by the experts.

In this part the teacher describes the steps for calculation of the exercise solution in details. He/ She encourages the scholars that with this system the problem can be solved. however if they try a few other manner to clear up the trouble and it doesn't paintings, they ought to throw that plan away and attempt a brand new one, with out dropping wish within the manner of the hassle

solving. The forth precept – test/ widen. Pólya mentions that it could be accomplished lots if you take a while to suppose and to appearance back to what you've got performed, the things that you have completed and the ones you haven't. in an effort to let you see what strategy to apply to resolve issues inside the destiny, if they're related to the unique hassle. on the end the instructor congratulates them for the successfully completed paintings and he/ she encourages them to use those concepts while fixing the alternative exercises. if they have some new answer and thinking, they have to ship it to the teacher in order that it could be published and shared with the opposite students.

### III. IMPLEMENTATION OF WEB SOFTWARE

The use of those principles a web utility “Math labyrinth” has been made, in which textual sports related to the real lifestyles are set [4]. For every exercising which is about at the web application first there is a practise the usage of the standards of Pólya and the hints that are received from the survey. (Figure 2).

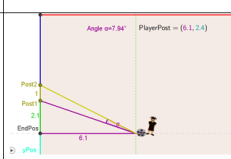
area/topic/subject – Differential counting

Problem - 11

A football player runs on the field parallel to the outline. Where should he stop to hit the ball towards the goal so that the angle for scoring in maximum?

(Determine the horizontal angle formed by the first goal post, the football player and the second goal post)

Note: The parallel line on which the football player runs should not cross the goal. Why? What is the maximum angle for the player to hit the ball in this case?

Steps/Stages	Help/hints	Answer/solution
Can you make an animation of the position of the football player and the angle for scoring a goal?	Use GeoGebra. Use floating and state points	Floating point, the football player. State points, all the other points to be used.
Use this animation to determine the position of the football player (if you have not made your own animation)	Use the slider for the movement of the football player.	

<https://tube.geogebra.org/m/M7YfNB8r?do>

Figure 2. An example of a ready task.

with the aid of signing the internet web page as an administrator (instructor) you may set the physical activities. the primary menu incorporates Math Labyrinth-home, manage customers, manage exercises and data. manner of placing the sporting events. by way of deciding on the choice control exercises, fields for coming into the workout are opened, inside the discipline workout Description, the textual content of the exercise have to be entered, inside the discipline exercise name the name of the workout should be put, and within the field workout subject matter, from the dropping menu, the topic of the workout should be chosen (Figure 3).

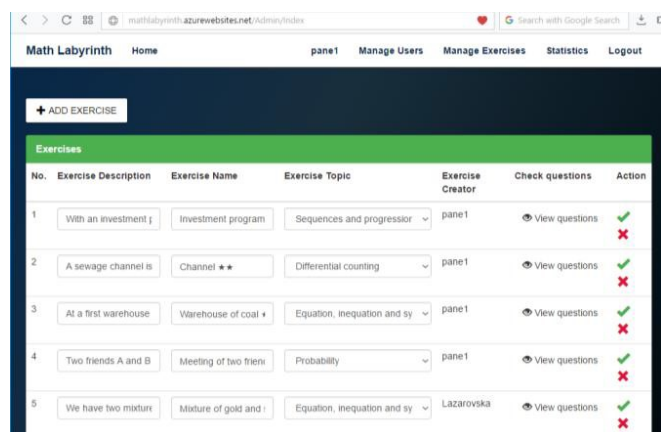


Figure 3. Manage Exercises

Via clicking on View query, you visit the subsequent window wherein you write query, help, solution and further. In every discipline you can add text or a document with the aid of selecting one of the buttons upload/Edit textual content or add/Edit file. within the subject question you write the query in Latex. In assist you add some type of assist for the question with the intention to get to the solution. In answer you write the answer of the question, photo or hyperlink to some applet that is related to the answer. In additional you upload the additional statistics about the applet construction, the development of the Figure or some different additional records which may be used by the students at the same time as fixing the physical games (Figure 4).

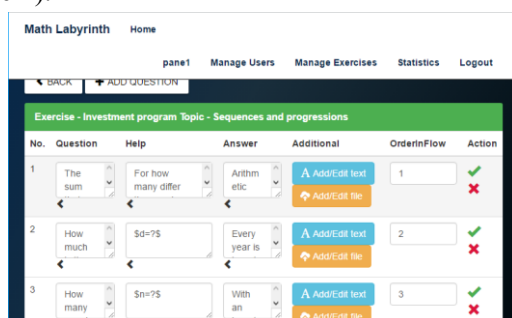


Figure 4. View question

Within the discipline Order in flow you pick the ordinal wide variety of the question in the exercise and at the quit it's far recorded. after you input all of the questions and the answer we move again to the home page and the entire exercise is recorded once more. this is the manner wherein all physical activities are set at the net utility.

- How will the scholars use the net application?

by using signing the web utility as a pupil, each pupil can use the given exercises. the primary menu carries: Math Labyrinth domestic and Logout (Figure 5).

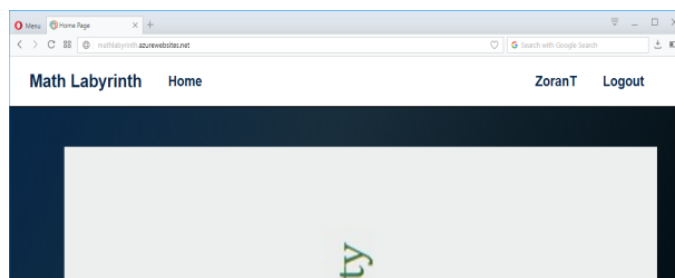


Figure 5

In home all themes are set. by deciding on a subject matter you go to the physical activities which might be set in that subject matter. The pupil can read the titles of the physical games and their content. If the scholar wants to resolve a few workout and to see what's its answer, he/ she clicks the button Play as a way to start with the exercising, in other phrases to begin with “the sport” in Math Labyrinth. the stairs for solving are set in a form of labyrinth, and that's why the complete application is referred to as Math Labyrinth. by way of clicking the button Play you begin the technique for fixing the workout. First you open one window, wherein you may see the ideas of Pólya written and then you definitely pick the work model of the workout: check mode- if you most effective need to use the questions and the assist for purchasing to the solution of the exercise, in other phrases it only assessments you if you could get to the solution or practice mode- if you want to use the questions, the assist and the answers for each query, a good way to result in the answer of the exercise (Figure 6).

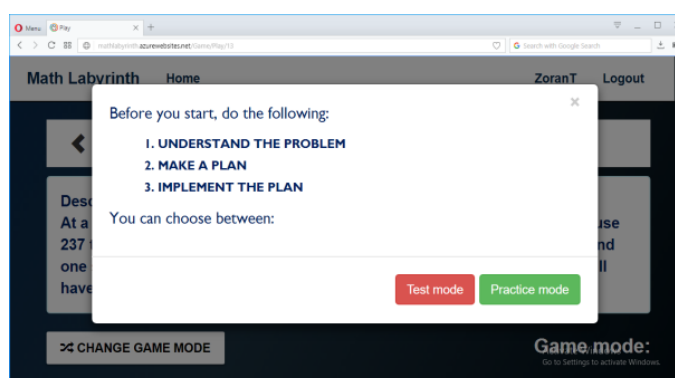


Figure 6. Test mode and Practice mode

by choosing one mode for solving the exercising, a window is showed wherein the labyrinth is ready and by



means of clicking the button #1 you start the procedure of offering the exercising (Figure 7).



Figure 7. Math Labyrinth

In each step there is only one question which needs to be answered by the pupil, some Figure or link to an applet where the pupil should go in order to see the visualization of the exercise or the solution (Figure 8).

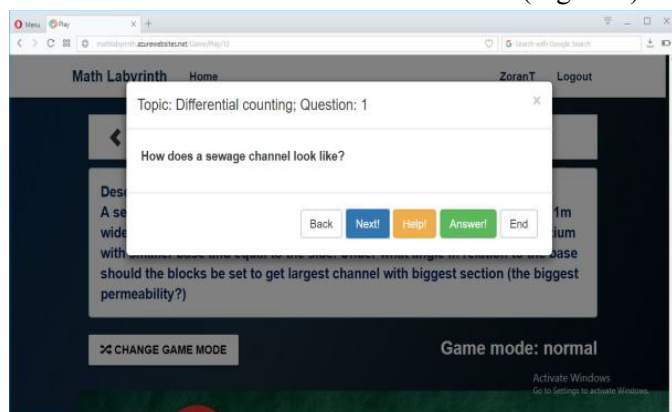


Figure 8. Steps in solving the task

After completing the system for fixing the exercising, in other words doing all steps foreseen by means of the trainer, the scholar gets the solution, and then additionally a window wherein is written congratulations on his/her patience. meanwhile it encourages the scholar to try independent fixing of the remained sports.

#### IV. USE OF THE WEB APPLICATION

If we are signed as notable Admin, inside the area for data we can see what number of users are registered at the site, how a lot of them are students and what number of instructors. for the duration of the take a look at duration, this internet web site was used by 20 instructors and all of them have advantageous considering it, for the manner of presenting the sporting activities and the use of the internet website. within the first 12 months 130 pupils had been registered as users

of this web web site. The trainer can see which students have used this web page to this point, how long had been they at the web page and which sports they solved completely. One completing survey was executed on the stop of the test duration. a few questions from the survey and the given solutions:

- To the query “Did the solving of sensible exercises increase your motivation for analyzing mathematics” 75% of the scholars requested stated that their motivation for analyzing mathematics became accelerated. Did the solving of practical sporting events growth your motivation for studying arithmetic

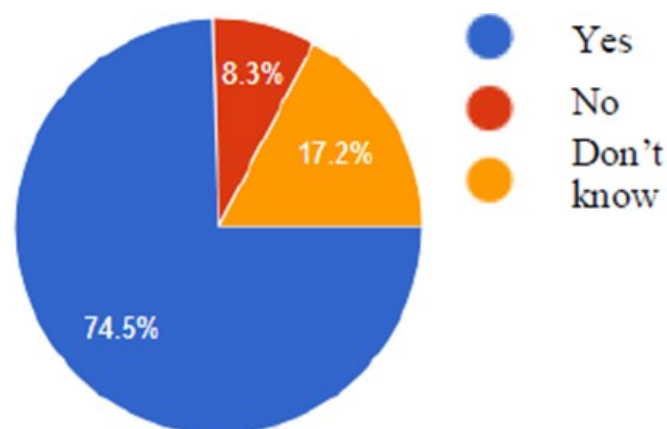


Table 3.

To the question “Did the usage of the net site help you while doing all your homework?” seventy one% stated that it continually or frequently helped them even as doing their homework.

Did the usage of the net website assist you while doing all your homework?

- To the question “Did using the web web page help you while doing all of your homework?” seventy one% said that it continually or often helped them while doing their homework.

Did the usage of the internet website online help you while doing your homework?

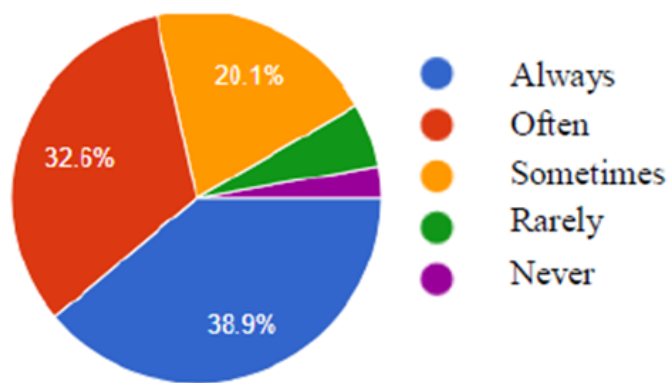


Table 4.

- To the question "Did the visualization of the sporting events and the use of loose software program assist you to apprehend and to solve the sports more without problems?" 78% of the scholars stated that they constantly or frequently helped them even as doing their homework.

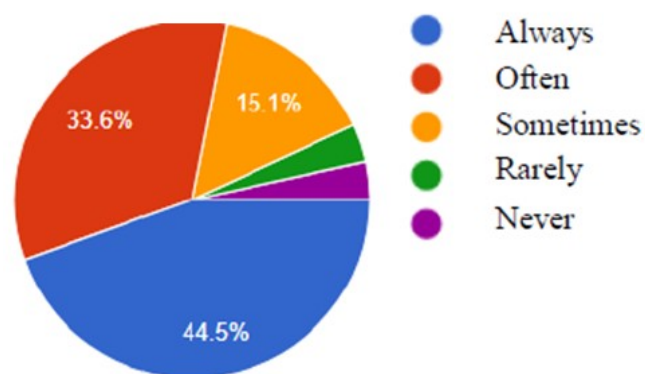


Table 5.

Did the visualization of the sports and the use of loose software help you to understand and to remedy the sporting activities more without difficulty?

## V. CONCLUSION

By means of the usage of the net software and IT within the math teaching, even as fixing sporting events and their visualization, the motivation of the students from the health club for studying mathematics has been accelerated. lots of students are glad that they get to the solution of the sporting events in domestic conditions with the assist of the visualization and the assist of the website. consequently we inspire you to apply this application and other net applications or free software at the same time as solving the math troubles, because we

are able to have students who may be encouraged to take a look at arithmetic and to obtain higher effects.

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