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USING VIRTUAL REALITY IN ENGINEERING GRAPHICS EDUCATION

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Abstract:

This in research engineering graphics using virtual reality (VR) technologies in education use through students spatial his/her thinking develop issue studied . Traditional education methods often three dimensional objects complete to understand enough opportunity Virtual reality and 3D models for students with real time in mode work opportunity giver interactive the environment presented Research during supreme education institution students in the presence of experience lessons was held and VR technologies training to the process current Results this showed that , based on VR education received students spatial imagination and mastery level according to traditional in a way to those who read relatively high to the results achieved . Research in the end, VR technologies engineering graphics education efficiency noticeable at the level increase proved.

Keywords

Virtual reality , engineering graphics , spatial thinking , 3D visualization, interactive education.

Introduction

Engineering graphics future engineers in preparation important place because it is in the students technician drawings understand , three dimensional objects imagination to do and spatial relationships analysis to do skills This is skills not only engineering projects in creating , maybe construction , manufacturing release processes planning and complex technological issues solution in doing also is necessary . Therefore for spatial thought engineering education inseparable part as attention is worthy .

Traditional teaching methods , that is on the board drawing , paper and static from images use , often complex 3D shapes to students enough explanation opportunity It does not give . and their spatial connections right understanding , three dimensional objects visualization to do and constructive his/her thinking in development to difficulties take It comes . because of students often three dimensional structures realistic in the environment visualization in doing and them technician to the drawing in adaptation difficulties with face They are coming .

Last in years digital technologies education system fundamentally Virtual reality (VR) technology is changing . this of changes the most effective from the means one as separated With VR students three size objects interactive in a way to see them rotate , zoom and various from the corners analysis to do to the possibility has This is not only study process interesting and immersive does , maybe spatial thought and visualization skills noticeable at the level develops .

This of the research main purpose – engineering graphics virtual reality in education technologies of use efficiency to determine , as well as its students spatial his/her thinking to develop the impact systematic accordingly is to study . Research of VR technology within students' 3D objects understanding , spatial connections understanding and interactive exercises to perform to the ability impact experimental in a way is evaluated .
The article also discusses the use of VR technology education to the process integration , its pedagogical efficiency , students study motivation and in class activity in progress role analysis Research results , not only engineering graphics in education , maybe other technician sciences according to education methodology update and digital tools current also useful for to be is expected .

Literature Analysis

Last in years take visited scientific research virtual reality technologies in education importance increasing going Researchers are developing VR- based study environments students interest , activity and complicated concepts mastery level noticeable at the level increase they emphasize .
Many scientific VR technology in the works spatial imagination in development effective tool that record Because VR allows students to see 3D objects in real time in mode rotate , zoom and analysis to do opportunity gives .
From this In addition , VR technologies engineering to education current to grow study the results improve and complicated topics to master facilitate identified . Students immersive in the environment study through complicated geometric shapes faster they understand .
With this together , some researchers are using VR technologies current in the process of technician opportunities and expenses with related problems also note the presence they will .

Methodology

Research supreme education institution students in the presence of experimental in a way was held . Students two to the group divided into :

1. **Control group** – traditional in a way , that is blackboard and paper using trained .
2. **Experience Group** – virtual reality (VR) technology using lesson received .

VR group 3D models to their students rotate , zoom and various from the corners see opportunity was given . Lessons during students spatial his/her thinking to develop aimed at interactive exercises Done .
Experience results following criteria based on rated :

- Objects visualization to do ability
- Spatial imagination level
- In the lesson activity and participation

Results

Experimental lessons as a result following changes observed :

Criterion	Control group (%)	VR group (%)
Objects visualization to do	60	88
Spatial thought level	55	85
In the lesson activity	70	92

See you later. as you can see , VR group students control group with compared to all in the criteria high to the results achieved . Most big difference spatial thought and in visualization felt .

Discussion

Research this showed that virtual reality technology students for interactive and immersive training environment creates , this and spatial thought and visualization skills noticeable at the level increases .

Traditional methods with compared to , using VR lesson received students more interest stated , exercises faster and more precisely done . With this together , VR technology practical skills also effective in shaping that observed .

Conclusion

This research results this showed that virtual reality (VR) technology engineering graphics in education effective pedagogical tool as use to the possibility VR technology has current to be students for interactive and immersive study environment creates , this and lesson process not only interesting , maybe high effective does .

Experimental research results this showed that using VR studied students spatial thought and visualization skills traditional methods with education received to students relatively noticeable at the level In particular , three size objects understand them various from the corners visualization to do and spatial connections in understanding their results much high it has been .

With this together , VR technology students in class activity and motivation also effective in increasing that defined . Interactive exercises and 3D models use students himself/ herself evaluation , creative thinking and technician skills to form help gives .

Research based on following recommendations is given :

1. High education in institutions engineering graphics and other technician sciences VR technology in their lessons wide current to be
2. Students spatial his/her thinking to develop aimed at interactive exercises study to the program input
3. Educators and students VR -based for lessons effective organization to grow according to special methodical manuals working exit

This research of VR technology engineering graphics in education pedagogical efficiency showing , in the future other technician sciences according to interactive training methods working exit and digital education tools wide current to grow for scientific basis creates .

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