

In the above instructions, command `ranint(m,n)` is a JavaScript function that returns a random integer number between m and n . Hence, variables x and y are set randomly, and a different equilateral triangle is displayed on the screen each time “Execute” button is clicked.

It is also possible to obtain the coordinates of points on the Cinderella figure. The following JavaScript instructions display the coordinates of the point A.

```
cs_to_js("c1","A.x","x"); cs_to_js("c1","A.y","y"); alert("x="+x+", y="+y);
```

When the above instructions are typed in the text area and “Execute” button is clicked, the web application displays the coordinates of the point A on the screen.

4 Conclusion

With the increasing need for ICT education in recent years, IT devices are being introduced in classrooms. Compared to the hardware situation, the software environment has not improved much. In order to improve this situation, the authors proposed a standalone web application in [1], with which school teachers can create e-learning system questions by themselves.

This paper proposes an extension of the web application in [1]. The proposed web application in this paper allows for free placement of radio buttons, text areas, Cinderella figure, Quill editors, etc, and is more flexible than that of [1]. Hence, it can be used to create various teaching materials including e-learning systems. With the new web application, we can manipulate the coordinates of points or lines in the Cinderella figure with CindyJS or JavaScript codes. This feature allows us to add programming elements to our teaching materials.

We illustrated how to use our system by creating a teaching material that explains how to construct equilateral triangles. Moreover, into the created teaching materials, we embedded a text area where we can input and execute programs that manipulates the equilateral triangles. This means that our system can be applied for programming education.

Currently, we are working for two future targets. The first is to increase the number of teaching materials created by our system, and the second is to increase the components of our system by utilizing various JavaScript library.

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References

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