

# Alice in Wonder Classroom

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## Problem and Motivation

It is undeniable that everyone has different ways of learning, so there is a need to have different ways of teaching for different individuals. Such need is seen more with the children with special needs. Unfortunately, the special education system today still uses collective or general teaching practice to address special children's individual needs. According to an essay published by Harvard Educational Review and written by U.S. special educationists, Alan Gartner and Dorothy Kerzner Lipsky, the general practice of teaching would not work with the practice of special education because general teaching does not have lessons practicing high level cognitive skills which are vital for special needs students. Besides, in general teaching, teacher can only allocate small amount of time in activities that could be considered direct instruction with active learner response and teacher feedback. General teaching also gives students a low frequency of contingent teacher attention (Gartner and Lipsky 165).

Through more research on the software programs currently used in special education, it was found that the software programs have several shortcomings. First, they are very expensive. Most of the software for special education works only with its own assistive technology devices, which makes the price very high and out of reach for special needs children from financially poor families. Besides the high cost, the book *Reaching Students with Diverse Disabilities* describes how most of the time the assistive technology devices sit in a corner of a classroom and collect dust. The teacher might order several assistive technology devices for the students, which after a while the teacher and the students end up not liking because they have already used it over and over, and it does not have anything new to offer (McGrath and Johns). Next, the assistive software undermines every child's individual needs and deal only with more general problems like language skills or mathematical skills, which clearly does not promote direct and effective instruction. An essay, *Social-Communicative Skills in Higher-Functioning Children with Autism*, written by William D. Frea in 1995 still holds its validity. According to the essay, effective social interaction and a rich social network are often easily taken for granted in education system, but such successful social interactions are one of the most difficult challenges for children with autism. These difficulties in social interaction can increase behavior problems, likelihood for maladaptive behaviors in later life and decrease the positive development and support in successful peer relationships (Frea 65). There are very few and limited software found through my research that assist with social interaction. Thus, the problems with the software and assistive technologies available today for special education system are expensiveness, repetitiveness, generalization of teachings being addressed and limited social interaction.

## Background and Related Work

The idea to improve the special education system grew stronger in me when I worked with the children with special needs as a volunteer through my school in an organization in my country, Nepal. During one of my visits, I saw an instructor in one of the classrooms, who went on with his lessons despite the fact that his students were not paying attention. His technique to teach each child with special needs made me think a lot about what could have been done to help the kids as well as the teacher. In addition, being a Computer Science student, my basic

understanding of technology was to impact society with ideas and convenience. Thus, to remove the discrepancies of the special education system mentioned above, I was looking for a simple technological tool that could be used by many. During my first semester of college, my professor, Dr. Madeleine Schep, showed me a paper about *Alice*, 3D animation programming software, written by one of her graduate students. The paper discussed how she, a special education teacher, with the aid of a computer science teacher, used *Alice* software in her classroom (Muller-Pearson). The paper did not discuss, however, how *Alice* was used, on how many students, what the effects and the drawbacks were, and what more could be done. My mentor and I wanted to go in-depth in finding the impact *Alice* or 3D programming could have in effective and direct instruction.

### Approach and Uniqueness

In order to solve the problems raised from the available assistive technologies, *Alice* can be very effective because it is free, it can create unlimited animations and it requires no prior programming knowledge. As far as addressing individual needs is considered, *Alice* can help teachers to model social skills he/she wants to teach and give guided practice to the students, which they can practice independently. In addition, *Alice* helps to develop concrete objects in a 3D environment making the animations relatable. The concrete objects of *Alice* are real world objects like houses, trees, animals, people, and cell phones. This quality makes it easy to use *Alice* to create a colorful animation for telling a story, creating interactive plays, or videos to be easily shared. In addition, video modeling has been shown to help with teaching skills to children with autism, according to an article published on *Journal of Applied Behavior Analysis* called “Using Video Modeling And Reinforcement To Teach Perspective-Taking Skills To Children With Autism.” Animation is unique and can be more effective than video-modeling due to its capacity to imitate the environment of the classroom and each student’s physical attributes. In short, *Alice* animations can be more effective than known modeling practices due to its flexibility and real-world object simulations.

With all these ideas as a starting point, I conducted a research at Polo Road Elementary School in a special education classroom with 10 autistic children, using *Alice* after receiving a grant from the South Carolina Independent Colleges & Universities (SCICU) grant committee. The children in the classroom were all below the IQ level of 50, and thus, were unable to perform seemingly general tasks like, lining up, washing hands, and cleaning up after play without instruction.

The procedures used in the research were as follow: we divided a certain idea, skill or concept that the teacher wanted to teach to the students into step-by-step instructions; I developed these instructions into a 3D graphics animation using *Alice* and showed it to the classroom; I observed and collected data while the animations were shown; I discussed the students who did not grasp the animation with the teacher; I created personalized animations for those particular students and discussed more on how *Alice* can be further used to satisfy each student’s learning need; and, I submitted the data and summary of each visit to the instructor and discussed more effective ways to use the software in order to aid the students.

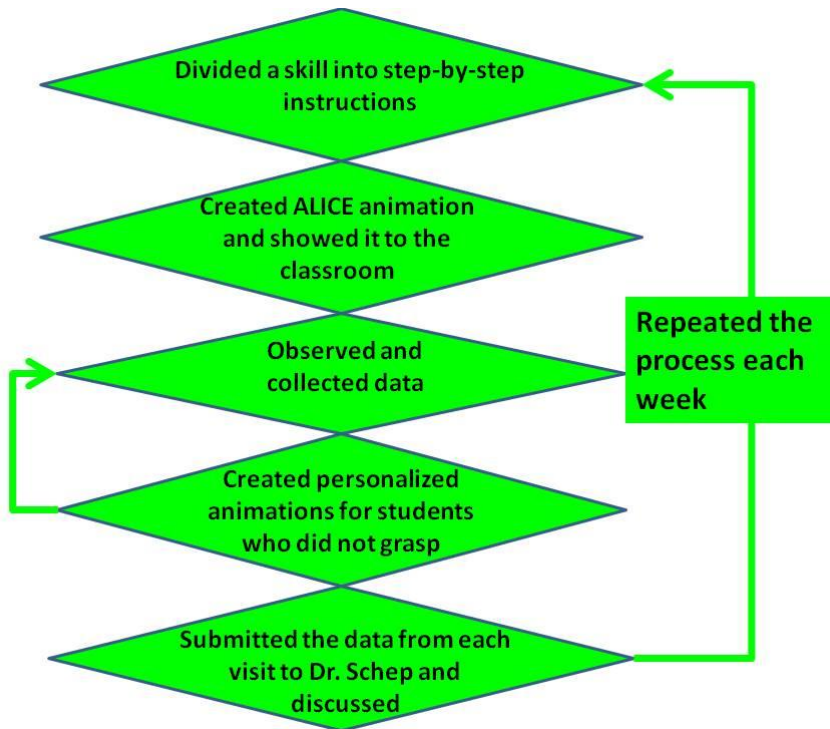


Figure 1: The procedures followed in conduction research at Polo Road Elementary.

These procedures were repeated for three months, by the end of which a total of 10 animations were created:

1. Lining up in the classroom
2. Circle Procedures without Inappropriate behavior
3. Circle Procedures with Inappropriate behavior
4. Washing hands after coming out of Bathroom
5. Cleaning up the toys after Time-out
6. Lining up in the hallway
7. Eating Etiquettes
8. Putting on Clothes
9. Tying up shoes
10. Creating Letters

## Results and Contributions

*Alice* proved to be very effective to be used as a teaching tool in special education. I introduced a new animation each week to the classroom but we also continued showing the older animations to the children.

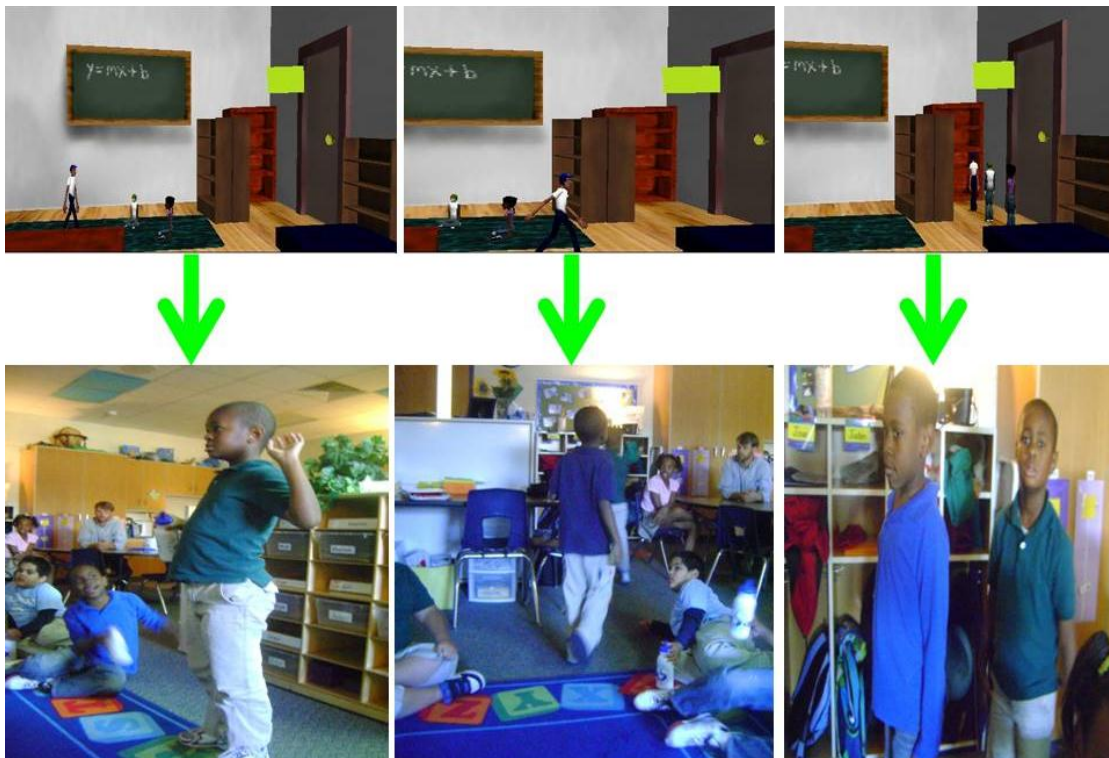


Figure 2: The step-by-step process of lining up and how the children at Polo Road Elementary’s Special Education Classroom followed it.

Note: Monitoring the rights of children with special needs, the pictures above are taken after receiving a signed consent from all the children’s guardians.

As it can be seen in Figure 2, the students were following the animation showed to them without requiring much interaction. The teacher in the classroom shared that prior to using *Alice* in the classroom he had to send each child to the door physically. The students would not grasp the concept of lining up and would frequently cause disruptions.

		Average of the number of students who showed change in their behavior per week									
		Visit 1	Visit 2	Visit3	Visit 4	Visit 5	Visit 6	Visit 7	Visit 8	Visit 9	Visit 10
Animations used	Lining-up	52 %	58 %	56%	72%	71%	70%	80%	90%	90%	90%
	Circle Procedures	-	81%	76%	82%	89%	70%	60%	90%	80%	80%
	Washing hands	-	-	90%	56%	82%	70%	60%	60%	50%	50%
	Cleaning toys	-	-	-	52%	60%	40%	50%	60%	40%	60%
	Lining up in hallways	-	-	-	-	80%	70%	60%	60%	70%	70%
	Tying up shoes	-	-	-	-	-	100%	100%	100%	100%	100%
	Putting on Clothes	-	-	-	-	-	-	100%	100%	100%	100%
	Eating Ettiquettes	-	-	-	-	-	-	-	50%	40%	60%
	Letters	-	-	-	-	-	-	-	-	80%	70%

Above are the results collected from each of my visits. The percentages calculated above is the total number of students who followed the animation divided by the total number of students present during the visit. There are only nine animations in the table because the two animations, Circle Procedures without Inappropriate behavior and Circle Procedures with Inappropriate behavior worked differently on different individuals. Few students grasped the behaviors they were not supposed to do and followed accordingly whereas, a majority of the students followed animation with appropriate behaviors only. Some of the animations were made for individual children, which is why the change was 100%. Some of the times, when I first showed the animation to class, all the students wanted to try it out, so the percentage of change in behavior was very high however, as the weeks passed by- it was pretty hard for us to keep track of children showing change in their behaviors, as they would be less excited about it because they have already seen it before.

Overall, we still found *Alice* to be very effective in motivating, addressing individual needs of learning and teaching the children with special needs in their classroom. Thus, *Alice* is very effective than most of the available assistive technologies in the teaching and learning environment of children with special needs. It can help tremendously to increase the flexibility of software tools used in special education. It can also help to identify with the individual needs of each child with special needs and help the teacher to work to help them and, benefit the entire teaching habits in the school district. In the long run, we can imagine a school district promoting *Alice* as a training requirement for the special education teachers to promote their teaching.

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