At just 17 years old, the Illawarra Grammar School student has been named the 2018 NSW Young Australian of the Year — an honour which compliments her already long list of achievements and world-beating inventions.

Among Macinley's creations are a shield that dramatically improves protection for women from radiation during breast cancer treatment and a system that improves the effectiveness of solar panel technology.

Despite being labelled "a rising star in the male-dominated world of science", the current year 12 student said all of her projects have had to be developed as a hobby in her spare time because she receives no support from the schooling system.

"We need an education system that has been revamped. Allow us to be critical thinkers and use inquiry-based learning because the schools are currently not fostering curiosity," she said, speaking as part of a TEDxSydney/Acer panel.

Macinley said we have learnt more in the past 10 years than we did in the past 100 and this exponential growth will only continue moving forward. As such, she would like to see an education system that's able to keep up with that growth.

"Year 11 and 12 is far too outcome-based and I can say that from perspective," she said.
The young scientist said the schooling system judges students on how well they can memorise a formula or definition and apply that to a specific example — over and over.

"One example is chemistry class. We have to memorise liquids, solids, gases and the changing of state, but I have to memorise that in relation to refrigeration and if I don't mention refrigeration in my exam, I won't get the marks," she said.

"There's something seriously wrong. I know that's a broad example, but I can't take that knowledge and apply it to different situations."

Macinley's Smart Armour is able to block about 80 per cent of the harmful radiation that reaches the non-treated breast.Source:Supplied. Macinley said schoolchildren are lucky these days because the internet is able to provide a plethora of information for almost every topic, but this isn't a solution to the root problem of the education system. "Someone who is an IT person doesn't stand next to a plumber and tell them how to do their job, so why is the government telling teachers how to teach?" she asked.

"I am only 17 and haven't been in the world that long, but I know young people see things from a different perspective because we are not bound by dated ideas."

Macinley claims the evidence of success in allowing students to freely think outside the box could be found in her "Smart Armour" shield made from copper that can be used by breast cancer patients to protect their non-treated breast while undergoing radiotherapy. She said when she took her findings showing copper offered 20 per cent more protection from the harmful radiation that reaches the non-treated breast than traditional lead aprons, her supervisor was suspicious and told her to run the tests again.

"It was a perfectly reasonable response when you get findings that contradict expectations of society and what's been put out there before," she said.

But since proving her findings were accurate, the technology has been implemented for use by world-class, not-for-profit, integrated cancer treatment centre Chris O'Brien Lifehouse at RPA Hospital in Sydney and could be rolled out to other hospitals across the country later this year.

“[This proves] we need to not only be able to think outside the box, but go against what’s already implemented and ingrained in the workforce,” she said.

The year 12 student added that schools are far too slow at implementing emerging technologies like augmented, virtual and mixed reality.

“Unfortunately, I haven’t seen this in school at all — it’s something people my age at the end of high school will miss out on,” she said.

“Obviously it starts back at primary school and starts with getting people curious and interested at young age in the technology we have emerging.”

The use of mixed reality will make for a much more immersive learning experience.Source:Supplied

As head of professional development and learning at The School Locker, Steve Iuliano is responsible for demonstrating to schools how technology can be integrated into classrooms in order to achieve curriculum-based outcomes.

And while he is working to demonstrate the benefits of technology in the classroom to teachers, he said the real challenge is convincing captains of industry and government officials.

“We need to start thinking outside the box and looking toward the future, while making sure we are not neglecting traditional methodologies of the classroom,” he said.

“You still have to write, you still have to type, but the focus needs to move to a new level of augmentation.

“We need to modify the learning environment and completely redefine how the classroom might look when we do things previously impossible before we had technology.”

Mr Iuliano said he recently demonstrated the advantages of introducing mixed reality into the classroom by importing a bunch of 3D models from medieval times to give students an embedded perspective. “By using a 3D model instead of a 2D picture, we were actually able to get a perspective of the scale,” he said.