St Mary's School
CAMBRIDGE

# ACCOLADE
# Digital Edition

# Digital everywhere

## It's more than just laptops.

## Contents

# Welcome

Artificial intelligence will be one of the defining changes to the way we work globally. We pride ourselves as a school on supporting girls to become leaders at the forefront of their industries; consequently, the School has for many years emphasised the importance of High Performance Learning characteristics and it is exactly these that will allow our students to flourish in a world co-piloted by AI. It has been most impressive how the girls have shown a critical and considered approach and I would like to recognise the excellent work that the Digital Committee has done in supporting the development of our policies and procedures for using AI, thereby enabling the voice of our students to drive the next generational change.

I am delighted to have been able to support our focus for Accolade this year on technology and artificial intelligence. The project to redevelop the Computer Science curriculum has already shown significant progress and I would especially like to note the outstanding work the Junior School, in particular Mr Andrew Severy, does in going well beyond the national curriculum. Furthermore, Mr Gareth Funk has been instrumental in pushing a challenging but inspiring curriculum in the Senior School. The focus on not just programming but the critical, adaptive, and creative thinking skills that are required to be successful in the modern world set our students apart.

**Charlotte Avery**
Headmistress

**Alex Brough**
Assistant Head: Director of Digital Learning

# The impact of AI on academics

AI is not a new concept and has been researched in education for a significant period of time, however with the recent advances in generative AI especially, (those that can develop or to an extent create content) the need to address how this can be used for the greatest and most positive impact has come to the forefront.

A significant part of the work undertaken as a school has been to evaluate all of the software we are currently using and consider its impact to the students. From this we can begin to get a better understanding of the pedagogical impact of AI across the School, as just as in industry, each academic subject will be impacted differently. At St Mary's the core approach to digital learning is that it should enhance and not replace the lesson outcomes.

> **By creating an adaptive digital learning environment we empower all girls to access innovative learning and achieve as much as possible.**

One of the biggest advantages to the recent developments in AI has been to gain a much better understanding of how learning takes place, AI is not about saving time or making shortcuts but empowering learners to construct and form knowledge in a new way.

Pearsons report 'Intelligence Unleashed' centred the goal to *"make computationally precise and explicit forms of educational, psychological and social knowledge which are often left implicit."* In essence it looks to computationally model how learning takes place rather than find ways to streamline processes, as educators should. (Luckin, Holmes, Grifiths, & Forcier, 2023).

**This gets divided into three core models:**

**The pedagogical model** in which we look at how AI can empower the process of teaching.

**The Domain model** in which the knowledge and skills of the particular subject are learned.

**The learner model** which looks at what impacts the acquisition of this knowledge or skill.

As a school we have used this approach when developing our policies and approaches towards AI in the classroom, there is not a one size fits all approach for all subjects or key stages. Students at different ages are at different developmental levels in their cognitive ability and therefore do not learn in the same way. The fundamentals of pedagogy, such as Vygotsky's theories on zones of proximal development, will underpin how we blend AI into the classroom. Equally those with SEND often think in different ways. It is not uncommon for autistic, ADHD and dyslexic children to learn to read in a very different manner. AI has the power to support these processes and enhance the students abilities in order that they maximise their potential through informed and adaptive meta cognitive scaffolding for the neurodiverse.

As part of the pedagogical model, St Mary's mirrors its approach to High Performance Learning (HPL), our enquiry-based learning practice excels when used in conjunction with AI tools. Girls are encouraged to explore different responses and be critical of these, it is not about being right the first time but understanding equally why other concepts may not be applicable or correct.

The cognitive domains, values, attributes and attitudes that HPL encompasses are the fundamental building blocks of 'how learning takes place', by ensuring that our girls develop the right-thinking skills we are ensuring they are adaptable to new technologies. Furthermore, the School's focus on oracy and the power of language supports girls in using AI tools to their full potential. Those that best articulate their question, using the subject specific vocabulary with accuracy and autonomy will be best placed to unlock the full potential of AI systems.

## The impact of AI on academics

For teachers, AI can support in providing deep and meaningful feedback, it will do this quickly, but it is not the speed that is the benefit but rather the individualised and specific feedback to improve that it can help to offer. This has formed a core aim of the software review to ensure that AI is used for impact and not engagement in learning environments, most notably when ensuring girls at St Mary's understand how to improve their breadth and depth of understanding not just correct particular answers. In addition, AI can be used to provide insights into data and long-term performance so that teachers can better address misconceptions and target the support that individuals need (Luckin, Holmes, Grifiths, & Forcier, 2023).

When further considering the pedagogy around the use of AI we can start by considering AI as a way in which to replicate the acquisition and use of knowledge. We can then approach this in the short and long term by two pairs of concepts.

Firstly, the idea of procedural and semantic knowledge. When designing a lesson outcome is critical, the use of any technology should support the desired outcome and not become an additional one itself. Procedural knowledge focuses on fluency, this can be within a skill or action but essentially the ability to perform this with autonomy. The pair to this within this concept is semantic knowledge, the focus on the meaning of the knowledge and how this relates to other knowledge. When designing lessons that utilise AI it would be easy for both of these to be lost as the AI can in essence provide a shortcut to the outcome.

Teachers need to design the process of refining a question and response (the procedural skill of using AI as a tool) into the lesson in order to support the desired outcome of students acquiring semantic knowledge as the outcome. By criticising the response, they have to demonstrate they understand the meaning or skill they are looking to acquire.

## Artifical Intelligence
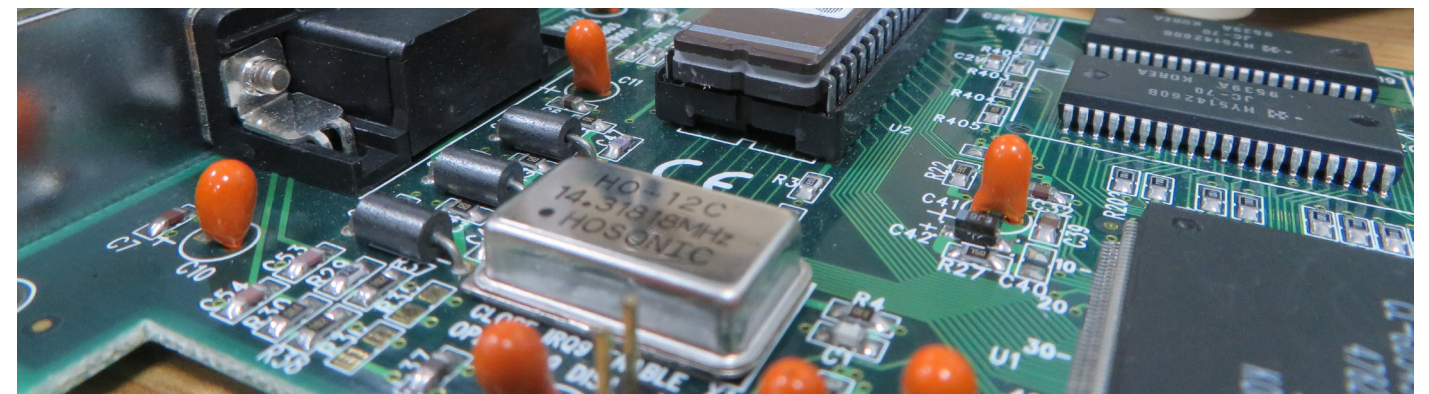


Furthermore, we can then consider in the longer-term schema theory, the idea that information will translate to knowledge when it is contextualised or grouped in a meaningful way.

AI can support in linking concepts, but the role of the teacher is then to refine this as the AI may offer information that is not relevant to the course of study or is outside of the scope of the lesson adding confusion not clarity,

it must be adapted to the learners specific needs.

> **When looking at how this can be adapted in the long term we will consider the design of our curriculum, both the substantive and disciplinary knowledge required.**

Where all educators and students need to be careful is the substantive knowledge,

what we take to be established fact. AI will utilise the database it has been given and the integrity and academic rigour of this should always be challenged, students and teachers will still need to fact check the AI output whether for a lesson plan, content, or task.

Where AI will be revolutionary is in the translation of disciplinary knowledge, the way by which we establish fact. This is not in trusting the AI itself outright but as a

## The impact of AI on academics

generative tool to create content that allows the abstract to become tangible. Many concepts such as the arrangement of particles during changes of state in science are difficult for students to visualise unless shown a representative model. AI will be able to generate specific and bespoke models for these concepts to better support students in deconstructing the idea. From this they can therefore re-scaffold the concept in order to better show their own understanding.

Our initial approach to the domain model has been to ensure students understand the value of the knowledge or skills they learn and therefore the subsequent value of academic integrity and achievement. The initial policy that has been implemented for the use of artificial intelligence at St Mary's has focused on using AI as a companion tool in which to offer a starting point to a solution, this output is then critiqued by the girls for bias, accuracy, and depth of content in order that the question can either be refined or the output built upon with their own knowledge and understanding.

Again, our HPL values underpin the approach in that students should be analysing, linking, creating, realising, and critically thinking about their response, the AI simply provides a platform to enhance or support this but not replace those cognitive processes themselves and

therefore the academic rigour and integrity is valued. How this looks in each subject will be different, in essay-based subjects it may provide the scaffold for an argument, in creatives a prompt or inspiration, in sports a guide to enhance practice, in mathematics a solution for students to reverse engineer in order to explain a method. Oracy has been a core focus for the School and the development of the students, tools such as Microsoft's 'Rehearse timings' utilise AI to offer instant and meaningful feedback on the quality of the presentation before the students deliver it as an assessed piece.

Fundamentally our approach to AI is to be at the forefront of each subject in order that the girls can excel no matter which career path they choose.

## Artifical Intelligence

AI can be a powerful tool for collaborative work, especially with those students whose first language is not English. Microsoft translate uses AI to establish the semantics of a sentence before translating rather than simply working through the syntax it has been given through shallow text processing. (The system recognises but does not understand the word in this case). Subsequently asking students to use the AI to then select verbs, nouns and adjectives in the Microsoft immersive reader then allows them better to understand how  the translation applies, especially where there is subject specific vocabulary.

Lastly we consider the learner model, at St Mary's we pride ourselves in the outstanding pastoral support students are offered alongside the strength of our academic success. Students' previous experiences, achievements and challenges impact engagement and cognitive load. AI will have the potential to link both the pedagogical and domain models to tailor ideal support for individual learners based on their needs, prior understanding, achievements, and manner of engagement.

As part of the reviews of the platforms we use we have aimed to ensure that each offers every learner the opportunity to access all of the learning and does not limit a students potential. (Luckin, Holmes, Grifiths, & Forcier, 2023).







# Introducing artificial intelligence into careers discussions

To support our Year 10 students in making informed decisions around their futures the School integrates careers advice into the additional digital application lessons many receive. Through these sessions students have been investigating the impact that artificial intelligence may have on the sectors they wish to work in and the job roles they may have throughout their desired careers.

> **The aim has been to allow the girls to begin to gain confidence in recognising AI as a copilot to their skills sets and work rather than replacing their role.**

With AI offering the potential to revolutionise the way we work many studies are being conducted into how this will impact different job sectors. The Avanade report on generative AI found that 96% of employees are confident they have the knowledge and resources as an organisation to implement AI in the long term. But that only 49% are confident that they currently have the right processes, risk management and policies in place for responsible use of AI. (Avanade, 2023).

It has been interesting to see the change of perception around the impact of AI on job

roles, **64%** of employers across a variety of industries felt that the tasks within a job role would change rather than lose the human element of the role itself, with many expecting their workforce to grow instead. With the power of this technology however being so significant it is unsurprising that **92%** felt their company needed to shift to an AI model within the next 12 months to remain competitive. (Avanade, 2023).

**The chart shows the comparative uptake of generative AI within different industry sectors.**
Image (Avanade, 2023)
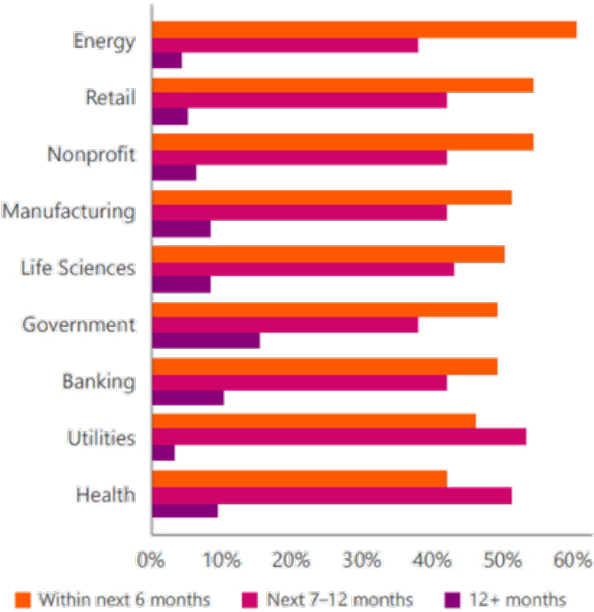
## Artifical Intelligence

This when however, compared to how ready these sectors feel, shows why many are now looking to be more reflective of all of their practices in order that they remain competitive in a responsible manner. The orange bar shows the percentage in each industry who feel they have a complete solution and guidance ready for responsible use, whereas those in red either are still developing guidelines or have not begun implementation. (Avanade, 2023)
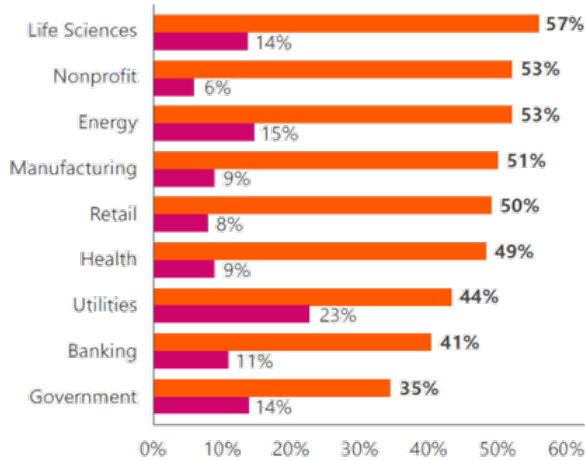


This approach to rapid adoption is why we have taken a very similar approach to the way we educate our students about the use of social media and other online platforms. The technology will develop at a rate that is faster than we can keep ahead of both as educators and parents. It is therefore critical that we instil the correct behaviours and values in students so that they are critical, considerate, and upstanding when using new technologies.

## Introducing artificial intelligence into careers discussions

**Our approach to AI has mirrored this so that St Mary's empowers girls to be at the forefront of technology, equipped with the morals and skills to use this confidently and appropriately.**

The analogy we have initially given is to imagine you are taking a cart of products to market. At the moment you have to pull that cart along a track in order to achieve this. Think of AI as a horse, it allows you to pull significantly more, and travel faster but the task fundamentally has not changed, the path to market does not change, you simply get more there faster. AI is about time saving but through efficiency rather than cutting corners, you don't reduce the task to save time but you can do the same task faster with fewer physical resources. Your role in this analogy then becomes far more cognitive, you need to learn to guide the horse, to give it the best inputs to get the best outputs.

This is the core takeaway for students, the depth of knowledge relating to your industry and critical thinking skills determine the quality of the input you give to the AI, therefore determines the quality of the output you receive. It is a tool to support learning and work rather than replace it.
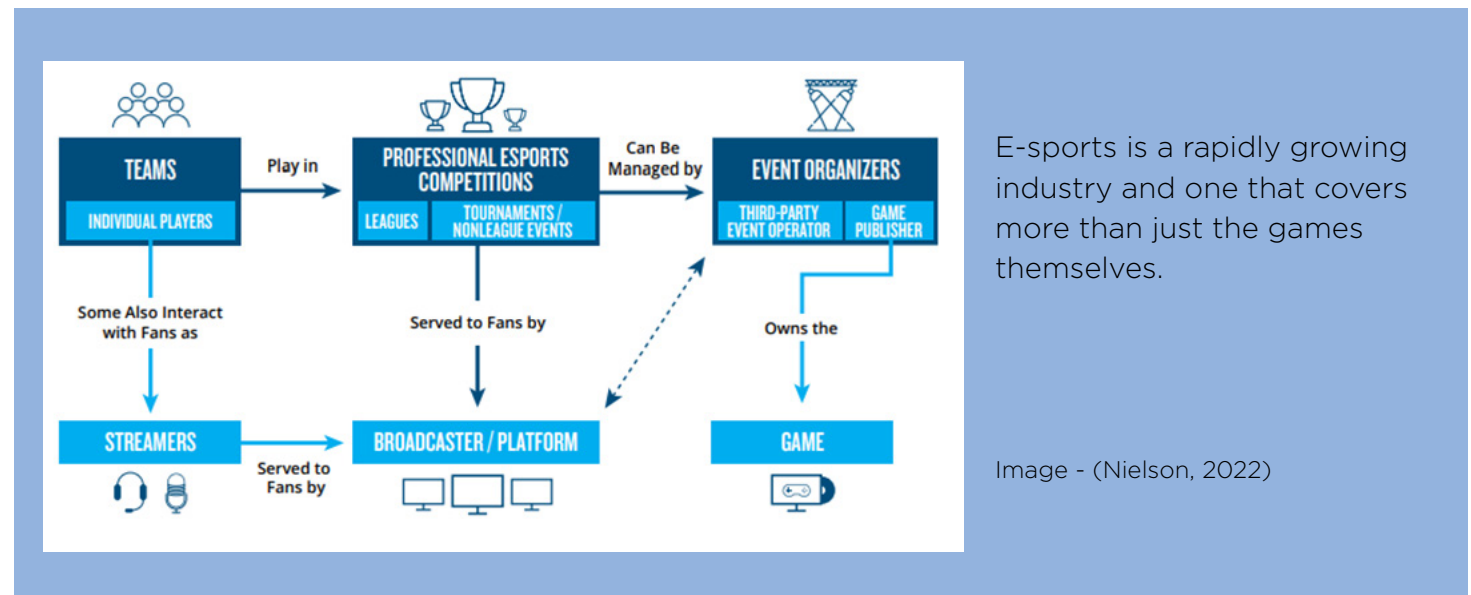
# E-Sports

## What are E-Sports?



E-Sports are a competitive environment where teams or individuals compete on video games.

Many major sports have expanded their offering by having associated E-Sports leagues and official players alongside their traditional teams or events. These include the Premier League in which clubs sponsor a player and Formula 1 where individuals drive simulators and represent each team in a championship. Typically, events are held in large stadiums or streamed worldwide with an associated broadcaster or service such as Twitch.

The tournaments can offer large prizes to the winners with the largest solo prize in 2022 was $15.2 million (influencer marketing hub, 2023).

For context the prize for the winner of the Wimbledon men's and women's final is roughly $2.9 million (£2.35 million) (Wimbledon, 2023).

As a team event the largest team prize was approximately $40million (influencer marketing hub, 2023) . The FIFA men's World Cup prize was approximately $42 million (Goal, 2023), the FIFA women's World Cup $4.29 million (Optus Sport, 2023).



E-sports is a rapidly growing industry and one that covers more than just the games themselves.

Image - (Nielson, 2022)
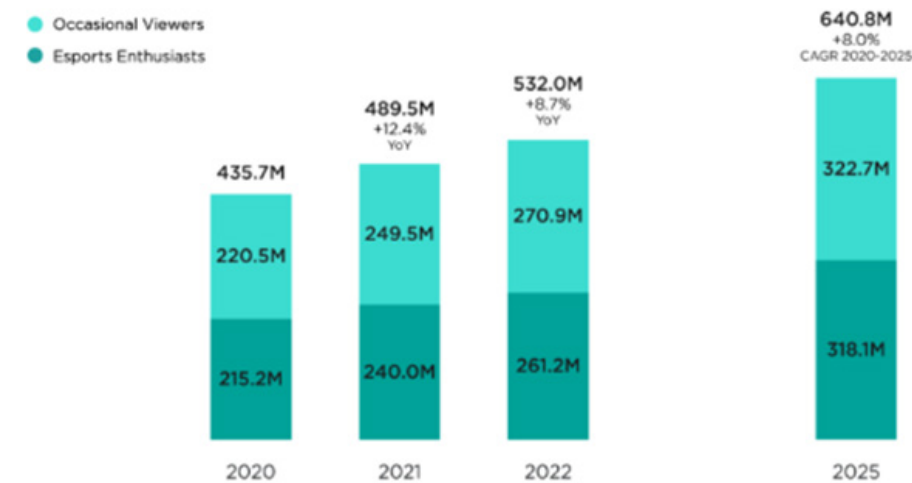


The growth in viewership in E-sports has been increasing year on year and is expected to continue to grow further, though sponsorship revenues may not grow in line with this.

Image - (newzoo, 2023)

The gaming industry is larger than many anticipate, in 2020 it was valued at **$159.3 billion**. When compared to music at $19.1 billion and the movie industry at $41.7 billion it has rapidly become the **highest grossing entertainment industry** and continues to grow. (Divers, 2023)

## How E-Sports fit into education

E-Sports and gaming in general have been shown to develop important skills in communication, planning and critical thinking as well as potentially improving wellbeing. Of course, this is when used in the correct manner.

It is important to stress that like any activity an excess can be detrimental, an important part of both the PSHEE and gaming programs is the recognition of gaming addiction as a World Health Organisation classified disorder and the healthy habits that go with the use of video games as a method for the release of stress and wellbeing. There are not many things that can give the same sense of affirmation, achievement, confidence and in essence invincibility like a video game can and so it is easy for students, especially those that are perhaps struggling academically, to become overly immersed within the platform where they feel they are in control. The work we do as a school helps the students to recognise when it is time to take a break and importantly when it is good to talk to others or ask for help. (World Health Organisation, 2023).

There can however be upsides to video games in terms of improved cognitive performance, in some recent studies gamers have been shown to have improved reaction times, working memory and visual analysis skills. The extent to which these are developed depends upon the games played with those that require the greatest cognitive load offering more benefits such as those that require the player to solve puzzles, work collaboratively towards objectives or evaluate information to determine their next action such as in open world games without defined narratives. (National Institutes of Health, 2023).

### What are E-Sports?

In one study *"Out of 33 surgeons from Beth Israel Medical Center in New York that participated in the study, the nine doctors who had at some point played video games at least three hours per week made 37 percent fewer errors, performed 27 percent faster, and scored 42 percent better in the test of surgical skills than the 15 surgeons who had never played video games before."* This was also balanced with the comments that playing for excessive periods of time each week will interfere with studies and is not therefore going to increase the chances of getting into medical school! (Stern, 2007).

The role of E-sports in schools however is to go beyond the game play itself and offer real world skills that they can transfer to other areas. Teams are encouraged to ensure they have a range of year groups in order that they develop their communication and social skills. Our in-school teams are organised by the House system to foster the community spirit that comes with this. The teams are required to fundraise, and event manage themselves in order that they gain experience in working with larger groups, taking responsibility for sections of the tasks, develop oracy skills when pitching to potential sponsors or event hosts amongst other soft and employable skills.

In summary it is not so much about the games as it is the development of community, support and soft skills that for some students, who are not traditionally drawn to performing arts, need to develop.

## Careers and gaming

There are now many industries that look to recruit through gaming platforms, the RAF is one of these. Many armed forces have found that elite gamers excel in roles such as air traffic control as they remain calm under pressure, communicate clearly and effectively as well as having increased working memory and concentration levels whilst performing the given tasks. The RAF have been using E-sports platforms to increase the recruitment pool (Forces Net, 2023).

Research is already underway at the University of Warwick to link gaming to AI and employability skills. The first stage of the research has been to identify which soft skills will be most important and can be developed through video games. They found that critical thinking, creativity and adaptability will be most important going forwards (University of Warwick, 2023).

# Digital technology through the School

There have been a number of interesting articles in the news regarding screen time in school and the use of technology. As education moves ever further towards digital content it is important we recognise the need for balance. The School's approach to technology is that it should support the learning that is taking place and not replace it, a number of staff have already begun to complete the Microsoft educator programs and we continue to invest in staff training in these areas to ensure we have the greatest positive impact we can.

We have recently introduced the H.E.A.R.T values for the house points system, these encompass hard work, empathy, agility, responsibility and thinking. As a school we also use these values when we consider the relationship between social media and education. As we can all appreciate social media plays a pivotal role in the lives of many of our students, for some it is the way in which they remain in contact with friends and family giving them the much-needed support network that is essential to their well-being and positive mental health.

We ask students to consider their approach to social media and other technology to try to make some small, but impactful changes to support their journey through school.

## 1 Hard work and health

Students need to be considering the amount of screen time they have especially on particular apps and equally as importantly when this takes place. As a school we subscribe to and offer to all parents the Tooled-Up platform in which there are excellent guides on: Good Sleep habits, Screen time and teens & Parents guide to screen time. Through PSHEE sessions we look at the impact of screens and sleep across many year groups so that students begin to self-regulate their time and consider how it is used.

## 2 Empathy and emotion

We are all often much braver when behind a screen! As students develop a better understanding of how to interact with others through technology they get better at filtering this bravery and considering how their messages will impact others. Our students continue to be a credit to the School, and we simply ask that they continue to replicate the overwhelming kindness, empathy and care they show each other in the digital world.

## 3 Agility and aspiration

Through PSHEE we work on the ideas of passive and active screen time. Where students do like to spend a lot of time on particular apps we would encourage them (where age appropriate) to look into how content is created and develop their own skills rather than just scrolling through endless posts. We would always encourage our students to be at the forefront of creativity and push to learn new transferable skills. They should be aspiring to achieve both in and out of school, looking to be the creator and not just the consumer in whatever industry the wish to work in.

## 4 Responsibility and risk

Our work this year on online safety has mirrored the ideas shared when considering screen time, students need to learn to self-regulate. We of course do not expect them to be perfect at this straight away but instead encourage them to be proactive when considering their interactions in the digital world. Technology will continue to gather pace and move forward at a greater rate than we as adults can keep ahead of. Students need to develop the correct behavioural approaches to new applications and technology, challenging which data it may gather or share, who can see their profile, what they post, how it reflects upon them as both an individual and working professional later on. By getting into good habits now rather than learning how to circumvent the rules students are better prepared for the world they will face.

## 5 Thinking and thriving

The concept of establishing healthy and considerate habits around the use of technology will fundamentally support their success through school, not just academically but also in individual development. To borrow the sentiment of our ethos and mission this is underpinned by our Christian heritage and the life of Mary Ward. As a school we work to develop intellectually curious, creative and compassionate young women with the aspiration, motivation, confidence and integrity to thrive in the world to come.

# Updates to the Schools facilities

The programme of replacing the Chromebooks for more suitable devices for the senior students has continued with further investment into the Microsoft Surface Pro devices. All students in years 7 to 11 now have these on a 1 to 1 deployment and we will continue to develop their use in and outside of the classroom through the year. This has been an important step in ensuring that all students have access to technology that allows them to be innovative, adaptable and take ownership of their learning.

Students now have greater agency over how they choose to store, record and use their notes in order to recognise and adapt to their own learning styles. In lessons staff give students the choice of which software to use for different tasks so that they begin to recognise which are suitable for given applications. Furthermore the School has updated all of the Junior School teaching devices to the Microsoft Surface Pro's as part of the first stage of futureproofing the technology.

In addition, we have carefully considered the feedback from parents, students, and staff



regarding how information and lesson content is shared. Having reviewed a number of systems we have chosen the Firefly platform in order to integrate as many of our services into a single platform as we can. This will be developed over the coming academic year ready for launch, but will allow parents and students to view timetables, house points, concerns, parents evening bookings, event bookings, lesson resources and news feeds amongst other features from a single dashboard. This system is being developed with the help and feedback from The Sixth in order that again students have ownership of their learning environments.

The next step will be for the School to continue to invest in the classroom spaces, our aim is to move away from the fixed rows and offer learning spaces that can allow for innovative and engaging teaching. The first phase of the building work for the new Mary Ward Educational Suite of classrooms is complete, these classrooms will offer us a unique and valuable space to explore the latest pedagogical methods around the use of technology in order that we remain at the forefront of girls education.

# School trips and residentials

St Mary's now provides a GoPro creator edition for students to take with them on all trips and residentials. This concept was trialled towards the end of the last academic year with a view that the students can take more ownership of the content they capture, create lasting memories, and learn valuable new skills working alongside the staff on the trip and with our outstanding in-house marketing team.

> **A phrase we are proud to use a lot is that our students are creators and not consumers, they are given the freedom and opportunities to represent themselves proudly as individuals and representatives of the School.**

The GoPro has already been used for our Senior School sports day, the World challenge trip to Tanzania, the bonding trips for year 7 and 9, the year 6 camping trip, the rowing teams competitions, sports fixtures and many more. Furthermore, Mr Oliver Frazer, our excellent Head of Rowing, has already begun to look at its use for capturing training footage and enhancing the girls understanding of their own performances.







# Coding in Juniors

It has been another very busy and exciting year for Computer Science at the Junior School with trips, special events and online competitions taking place, in addition to the weekly specialist-taught Computer Science lessons in our purpose-built STEM Lab.

Our Computer Science curriculum begins with the girls in Pre-School, who have been following a dedicated scheme of work designed to provide them with the basic coding skills that they will need once they move up into our Reception class and beyond. They have had great fun exploring sequences of instructions (especially directional commands) using a variety of devices and equipment.  These have included laptops, tablets, a 'BlueBot' (a Bluetooth-controlled robot) and their firm favourite a 'Code-A-Pillar' robot caterpillar!  These skills are then developed through our integrated seven-year Computer Science Programme of Study, which ensures carefully paced progression across the Junior School.

At the other end of the School, our Year 5 & 6 girls have been learning to use as wide a range of different programming languages and user interfaces as possible, so that they will be able to transfer their computational thinking skills to any new piece of software or situation. This is vital preparation, for secondary education and beyond, as programming continues to evolve with new technological developments. The palette of commands becomes much broader at this stage, and more advanced programming techniques are introduced. By the end of Year 6, the girls are familiar with concepts such as 'if/else' statements, simultaneous sequences, variables, sub-routines, forever loops, and RGB colour detection etc. The girls are also introduced to the skills required in text-based coding, using languages such as HTML, LOGO and Python, which will be further developed in Computer Science lessons at the Senior School.

In the second week of November, all of the girls in Years 2, 4 & 6 took part in the 'Bebras Computational Thinking Challenge 2023' during their Computer Science lessons.  This is an online competition run by Oxford University, which involves solving complex problems against the clock, using computational thinking skills such as algorithm design, pattern recognition, logic and abstraction. Our girls competed in their respective age categories against schools from all over the UK (over 408,000 students in total) and achieved outstanding results compared to those at both Cambridgeshire and UK levels.  In addition to results at a whole school level, the girls also received certificates for their individual achievements compared to national performance data, with the 'Merit' and 'Distinction' categories for exceptional performances being achieved by more than

## Digital technology through the School

three-quarters of the girls in the older two age groups and all of the girls in Year 2.

We were also delighted to discover that six of our Year 6 girls had achieved scores in the top 10% nationally and have been invited to participate in the online 'Oxford University Computing Challenge 2024'. Eight girls now in Years 7, 8 & 9 have also been invited to participate as a result of their exceptional performances in previous years' OUCC competitions, whilst at the Junior School, and will be supported remotely via Teams and email by Mr. Severy throughout their preparations, before coming back to the Junior School to participate in the Challenge itself.

In May, we were pleased to welcome 45 students from Stella Maris College in Madrid, Spain for our annual 'Computer Science International Outreach Day'. The Spanish students (all Year 8 boys) worked with our Year 6 girls in collaborative teams to learn how to program virtual (on-screen) robots as part of a RoboCupJunior inspired 'Rescue Simulation Challenge'.

RoboCupJunior is an international organisation that runs national and international coding and robotics competitions in a variety of age categories and leagues. Face-to-face competitions have been 'on-hold' for the last few years due to the Pandemic but, prior to this, teams from St Mary's Junior School have had great success at both national and



international levels. Most recently, in 2019, our Year 5 Team were crowned 'RoboCupJunior UK National Primary Line Tracking Champions' our Year 6 Team were crowned 'RoboCupJunior UK National Primary Rescue Simulation Champions' and four of our Year 6 girls were 'RoboCupJunior Euro 2019 Rescue Simulation Quarter Finalists' in the U19 Category in Hannover, Germany. We hope to be able to report back on future successes, as soon as these competitions resume.

The 'Computer Science International Outreach Day' consisted of a workshop session in our STEM Lab, led by Mr Severy, our Computer Science Coordinator, where the students were introduced to the CoSpace Rescue Simulation software package and learnt the basics of 'Event-Driven Programming'. They worked

## Coding in Juniors

together to develop their code to program their robot to compete head-to-head against another team's robot and collect as many coloured objects as possible. The objects then had to be deposited in the orange 'drop zone' before the end of the three-minute competition time and bonus points were also awarded for specific actions, all whilst avoiding obstacles and traps. Having completed their initial programming, the teams were then given a development session to allow improvements to be made, before taking part in a mini



competition. Certificates were awarded to the overall winning team, as well as for the highest individual match score and the best teamwork. Our girls thoroughly enjoyed working with students from Spain and discovering that age, language and cultural differences can enhance rather than hinder collaborative working, creative thinking and teamwork. They also gained a flavour of what a rich experience international competitions can provide, and we hope that this will inspire them to compete on a global level in whatever direction their future studies lead them. We are eagerly anticipating a similar event later this academic year.

Also in the Summer Term of 2023, our team of Year 6 girls (Ecoders) submitted their entry for the 'Young Coders Competition'. This is a national competition organised by 'The Worshipful Company of Information Technologists', for children in Years 4-8 to design and code an interactive computer game, using the 'Scratch' programming language, in order to raise awareness of careers in STEM-related industries, in accordance with this year's theme, 'A Future in STEM'. The girls worked on this project independently, predominantly in their own time during evenings and weekends, keeping in touch and collaborating via Microsoft Teams.

We were thrilled to hear that our team had been awarded 2nd Place out of almost 600 entries from across the UK! The judges' feedback was as follows:

*"Your game is really good and I love the concept of having a mini-game for each topic. The graphics are really good and the sprites are consistent with the backgrounds. This game does a great job at introducing STEM to the target audience."*

*"The game is well thought out and educational. The code included was well-written, and the game functioned well. I enjoyed playing the game; the graphics used in the game were excellent. I liked that you could choose a character at the beginning to play with. The game matched the theme set and showed great examples of STEM jobs."*

*"The game was fun and informative; it was in line with the theme. Great to have interaction throughout the game."*

Each of the girls received a personalised, engraved shield and a certificate and, as a result of their efforts, the Junior School also received a shield and a prize of £100! This has been used to purchase additional resources to enhance the Computer Science curriculum and

thus benefit all of the girls for years to come. The new academic year got off to a great start in October when fourteen of our Year 5 girls participated in an 'Introduction to Physical Computing Day'. This event was hosted by the BT Schools Enrichment Team at their headquarters in Martlesham Heath, Suffolk. The day consisted of a carousel of activities introducing the girls to various aspects of physical computing, as well as an opportunity to visit the 'BT Future Technologies Showcases', which are not open to the general public.



The girls learnt how to code Edison and Crumble Robots to accomplish a variety of complex tasks, and coded Micro:Bits to send and receive messages via Bluetooth and play music!  During the Showcase Tour they visited a hospital and shop of the future; experienced

the latest virtual reality equipment and 3D display screens; explored a fully immersive and interactive learning space; learnt about fibre-optic technology; and explored the possible future uses of automated recognition software to identify safety hazards and the need for PPE. Finally, they had their Participation Certificate presented to them by a 'Double' robot!

The girls were complemented by the staff and volunteers manning the various activities for their coding skills, intelligent questions and the high levels of interest and enthusiasm that they displayed throughout the visit.

In November, all of our Year 6 girls visited the 'Centre For Computing History' here in Cambridge. During the visit they participated in a series of practical activities including learning how to program 40-year-old BBC Micro computers using the text-based BBC Basic coding language, discussing the evolution of computers and their uses throughout history, exploring the development of computer games by gaining hands-on experience with a variety of historic computers and their original software, and creating their own Morse Code transmitters and receivers. They even played 'noughts and crosses' against an original Elliott 903 computer from 1967!

The staff at the centre were extremely impressed with the girls, not only in terms of

their Computer Science skills, but also with their interest in the development of computing and the historical figures who pioneered it, and their intelligent questions and observations throughout the visit.

All of the girls had a thoroughly enjoyable experience and now have a much greater understanding of the parts that they may be able to play in the next phase of developments within the computing and technology industries, by following in the footsteps of the pioneering women who have already been so instrumental in this field.

We are greatly looking forward to the resumption of face-to-face competitions against other schools, especially the national and international RoboCupJunior competitions, and hope to have more successes to report in the near future.
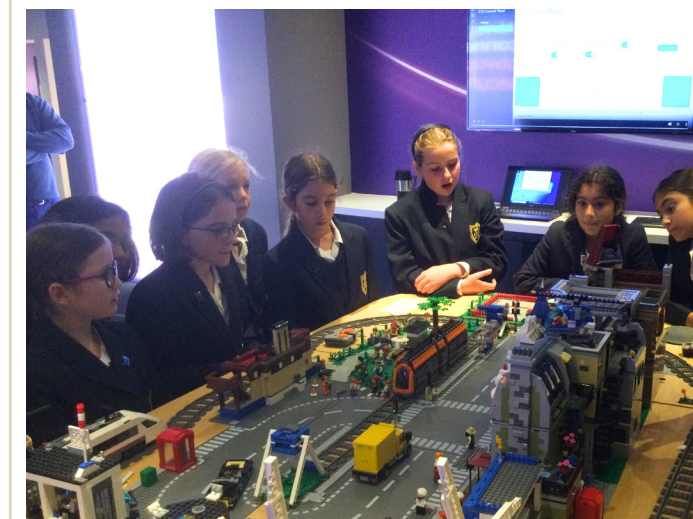
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