University of Liverpool Mathematics School

Monitoring visit report

Unique reference number:	147477
Name of lead inspector:	Helen Whelan, His Majesty's Inspector
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Type of provider:	16 to 19 free school
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Monitoring visit: main findings

Context and focus of visit

Ofsted undertakes to carry out monitoring visits to all newly directly funded providers of education programmes for young people within the further education and skills sector. This monitoring visit was undertaken as part of those arrangements and as outlined in the 'Further education and skills inspection handbook', especially the sections entitled 'Monitoring visits' and 'Monitoring visits to providers that are newly directly publicly funded'. The focus of these visits is on the themes set out below.

The University of Liverpool Mathematics School was formed in 2019 and opened to students in September 2020. The school provides education for 16 to 19-year-olds in Science, Technology, Engineering and Mathematics (STEM), with A-level courses in mathematics, further mathematics, computer science and physics. There are currently 76 students at the school: 43 in Year 12 and 33 in Year 13. Students are mainly from the Liverpool city region, but some travel from Chester, Southport and North Wales. The school is the third mathematics school to be established in the United Kingdom.

Themes

How much progress have leaders and managers made in designing and delivering relevant education programmes that have a clearly defined purpose?	**Significant progress**

Leaders have an ambitious vision to prepare students for significant professional roles within the local and global STEM communities. They do this through an academically rigorous curriculum and a nurturing, inclusive culture. Leaders carefully recruit students who have exceptional mathematical talent, students who have been disadvantaged in their education, and students who are less likely to participate in high-level STEM.

Leaders have high expectations for what students can achieve. They are not simply satisfied with preparing students for external examinations. They want students to think and behave as mathematicians and scientists.

Students achieve excellent A-level grades and are exceptionally well prepared for success at university. All 25 students who completed their A levels last year progressed to STEM-related degrees, most at highly prestigious universities.

Students benefit from a wide range of extra-curricular activities, trips and visits that enrich the taught curriculum. There are frequent visits to universities, museums and national competitions. There is a comprehensive schedule of weekly enrichment

clubs. These include anime, chess, debating and philosophy. Students enjoy attending these clubs and the opportunity to develop their talents and interests. Managers recognise that students would benefit from formalised work experience.

Teachers are very well qualified in their subject areas. Many have higher degrees and extensive teaching experience. Leaders provide weekly professional development sessions for teachers. These include teaching strategies, mental health awareness and ways to support students who have autism spectrum disorder.

Leaders undertake a range of quality assurance activities to evaluate teaching at the school. They have a close understanding of teachers' practices and how they can continue to develop. Teachers appreciate the collegiate and supportive culture at the school.

The board of trustees consists of highly qualified individuals from universities, schools and industry. They bring a wealth of experience of education and STEM and use this effectively to develop the school's distinctive nurturing and aspirational ethos.

How much progress have leaders and managers made to ensure that learners benefit from high-quality education programmes for young people that prepare them well for their intended job role, career aim and/or personal goals?	**Significant progress**

Leaders and teachers plan the curriculum very well. Students receive a broad overview of topics in lectures, deepen their understanding in lessons and further extend their learning in small supervision groups. Students benefit from an aspiring mathematician programme that gives them the experience of mathematics studied at university. Teachers encourage students to engage in university-style seminars by creating problems that lead to discussions.

Teachers expertly plan a logically sequenced curriculum to meet the needs of their students. They begin with a 'boot camp' to check students are confident in GCSE topics. They then move on to develop students' deeper understanding by focusing on proofs and mathematical reasoning. Teachers individualise the curriculum by ensuring that students undertake appropriate further mathematics options. For example, those students who want to specialise in physics study mechanics, and those who want to specialise in computer science learn modelling and algorithms.

Teachers skilfully teach sessions that make students think deeply and widely about how to solve problems. They use a variety of methods to develop students' knowledge. These include modelling answers on the whiteboard, setting students problems to solve and jointly working with students on longer questions. Students

expertly explain the development of their knowledge and understanding of differential equations.

Teachers use effective assessment practices to identify gaps in students' understanding. Their feedback ensures that students have the knowledge and mathematical thinking to solve similar problems in the future. In weekly supervision sessions, teachers explore marked homework with students to ensure they have a comprehensive understanding. Students grow in confidence because of the immediate feedback they receive.

Students have extremely positive attitudes to learning. They display high levels of respect for their teachers and peers. In peer activities, they are not afraid to challenge each other about their work in the spirit of seeking the best solutions to mathematical problems.

How much progress have leaders and managers made in ensuring that effective safeguarding arrangements are in place? **Reasonable progress**

Leaders use a comprehensive range of policies and procedures to help them to keep students safe. They risk assess the safeguarding of young people carefully, and they regularly review their safeguarding practices to ensure they are rigorous.

Leaders ensure that new staff are recruited safely and are subject to an appropriate range of pre-employment checks and a comprehensive induction programme. All staff and trustees receive safeguarding training that is updated annually.

Students are introduced to a number of important themes relating to life in modern Britain through a pastoral and personal enrichment programme. Despite this, students have only a basic understanding of the dangers of radicalisation and extremism and the importance of fundamental British values. Students feel that teachers' approach to teaching these topics has an emphasis on statistics and research. They would appreciate more discussion and debate.

Students feel safe and happy at school. They know who to speak to if they have any concerns about their welfare.

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