Student Robotics

Trustees' Annual Report 2020

From 1st August 2019 to 31st July 2020

Reference and Administrative Details

Charity Name:	Student Robotics
Charity Registration Number:	1163168
Principal Address:	Student Robotics Lytchett House 13 Freeland Park Wareham Road Lytchett Matravers Poole
Trustees:	Diane Dowling David Massey Jimmy Thompson Richard Barlow (resigned 22 August 2019)

Objectives and Activities

Student Robotics' purpose, as specified in its constitution, is the advancement of education and training for the public benefit, particularly in relation to engineering, mathematics, robotics, computer skills, computer science, computer software development and related subjects.

The primary activity carried out by the charity to meet its objective is the running of an annual robotics competition for 16 to 19 year-olds. This competition challenges teams of students to design, build and develop autonomous robots to compete in our annual competition. After announcing the year's game, we give teams six months to engineer their creations. We mentor teams throughout this time, as well as supply them with a kit which provides a framework they can build their robot around. We do not charge a fee to partake in the competition as it is felt that this poses an unreasonable barrier to entry, especially to those who may initially have minimal exposure to engineering and robotics and therefore may not begin with a high level of enthusiasm. Since exposure to real world engineering is woefully in education, this is a real and relevant risk.

We feel that the charity continues to be successful in meeting its aim of providing young people with an introduction to STEM careers. As our vision states "We want to foster a world where engineering and artificial intelligence is accessible to young people." The fact that our volunteers are almost entirely drawn from university students who have taken part in Student

Robotics in the past and that we continue to gather support from new schools shows that we are fostering a lively interest in engineering amongst the students who take part in our competition. Our mission is “To bring the excitement of engineering and the challenge of coding to young people through robotics.” and it is clear that we continue to achieve this.

Achievements and Performance

The 2019-20 robotics competition was completely disrupted by the coronavirus pandemic, which meant that our final competition could not be held because of social distancing restrictions. Nevertheless our volunteers were able to salvage enough material to arrange for a virtual competition to take place, which was held at the end of the traditional season.

The year began well, with a kick-start event on the 26th October, held simultaneously at three venues - in Southampton, London and Cambridge. Thirty seven teams registered for the competition and twenty-nine of these attended a kick-start event in person. As usual, the competition was announced and the kits of parts containing the main electronics for a robot were distributed to the teams. Most of the teams stayed at their kick-start venues to run through some ‘microgames’ designed to give them some familiarity with the kit and programming it.

These kick-start events are the first opportunity for our volunteers to meet and get to know the teams of sixth-formers who will be competing in the game. The kick-starts are also a great opportunity for our volunteers to plan and put together an event and to coordinate together across different regions of the country and hone their presentation skills.

The game for the 2019-20 season, called “A Game of Two Colours” revolved around identifying, locating and recovering cubes marked with ‘Libkoki codes’ which the robots can be programmed to recognise. In the middle of a 5.75m square arena was a square raised platform, 1.2m on a side. On top of this were eight cubes, four silver and four gold and close to the base of the platform there were a further eight coloured cubes, four silver and four gold. The aim of the competition was for a robot to recover cubes and return them to its starting zone, in the corners of the arena. The ‘twist’ to the game was that a robot only scored highly if it collected cubes of only one colour, and if both colours were collected the score dropped dramatically. With four robots in the arena at a time it was a game designed to give teams the opportunity to think of clever strategies for their autonomous robots to execute, with chances to steal competitors’ cubes, or plant unwanted cubes in an opponents territory to dramatically alter the scores. As with every Student Robotics competition, the robots must be fully autonomous and once the round has begun, no-one is able to interfere with the robots until the end of the round, two and a half minutes later.

For the first part of the academic year the competition proceeded smoothly, with teams seeking and receiving help from the volunteers both in person and through the forums on the charity’s website. The competition volunteers organised tech-days where teams could bring robots and problems for discussions and plans were well in hand for hosting the final competition at a new venue; Reading University. Then a couple of months before the competition finals were due to be held, the coronavirus struck and everything changed.

For as long as possible, the volunteers were investigating ways to safely host a competition involving thirty-seven teams, of between four and twenty-four sixth formers, along with their teachers and the small army of volunteers needed to run a two day event. Unfortunately after some weeks of changing plans, lock-down was announced and the competition team made the decision to cancel the face-to-face competition. No-one was more disappointed in this than the volunteers themselves, but they were determined to salvage as much as possible and to provide some form of competition to the sixth form teams.

The solution they came up with was to run a virtual competition using the simulator which had been written to allow teams to practice and develop their code. There were some restrictions - teams had to use the simulated robot provided, which would be different to the ones they had been building. Specifically, the sensors and camera on the model were different to the components that teams had used on their physical robots. Another constraint was that, during the virtual competition, it would not be possible to change the code of the robot between rounds.

Around twenty teams signed up to the virtual competition while lock-down was in full flood and the competition was held over several on-line meetings in July, with League games held on the 11th, 12th, 18th and 19th, culminating in a grand final on the 25th July. With no live venue possible during lock-down, all of the competition rounds were streamed on YouTube. Although not quite as tense, and lacking some of the atmosphere of the live finals, the on-line event was a success and brought the 2020 season to a conclusion. It was not the season we were all looking forward to, but successful nonetheless.

The disruption of the coronavirus pandemic makes it meaningless to compare competition metrics with those of previous years. However,we were very satisfied that at the start of the year we had recruited more teams for the season than in the previous year and none of the teams had dropped out at the time the first lock-down was announced. We were thrilled that twenty teams managed to engage with the virtual competition, despite many schools being closed and there being no possibility to meet for enrichment opportunities.

Structure, Governance and Management

Student Robotics is a Charitable Incorporated Organisation (CIO), registered on 18th August 2015. The charity is governed by its constitution which defines its objectives, powers and structure of governance.

Student Robotics is led by a board of trustees that communicate on a regular basis to discuss the direction and policy of the charity. The trustees also meet on a semi-regular basis to fulfil the requirements set out in the constitution.

The board of trustees is made up of engineering and computer science professionals and teachers. The specialised knowledge held by the trustees in these subjects is an advantage when meeting the charity’s aims and objectives since it ensures the technological content of its activities is both state of the art and relevant to its beneficiaries. Having two trustees who had managed student teams gives a clear insight into how the teams perceive the competition and the benefits they take from it.

Trustees have been recruited based upon their involvement with activities run prior to the registration of the charity and through word of mouth since becoming a charity. It is envisaged that future trustees may be recruited from past beneficiaries of the charity as they enter into the professional world. New trustees are appointed either by a resolution of the members of the charity or by a decision of the existing trustees.

As trustees have had prior intimate involvement with the charity's activities and are actively involved with the day-to-day running of the activities they are already well versed in the running and operation of the charity. To aid with this, the charity has a general approach of openness and transparency with regards to its governance and management, where appropriate.

All trustees are actively encouraged to contribute to and improve the charity's 'Operations Manual'. This manual sets out the operational structure of the charity; the delegation of powers to others in named roles, for the purpose of the day-to-day running of each aspect of the charity; and the processes to be followed by people in named roles. This manual is treated as a living document and is constantly evolving to meet the requirements of the charity.

The structure of the charity is organised with the aim of potentially offering other activities, in addition to the annual robotics competition for 16-19 year olds, at some point in the future. Therefore, the responsibility of running the charity's primary activity, the annual robotics competition for 16-19 year olds, is delegated to the Competition Committee, a committed group of volunteers who report regularly to the trustees. Other day to day management aspects that are not specific to an activity run by the charity, such as fundraising and welfare, are delegated to roles directly below the trustees. The robotics kit is maintained by a team led by the Kit Team Committee who have responsibility for developing and maintaining the kit that is used in the competition. The Kit Team comprises engineers and engineering students who bring a wide range of expertise to the task.

Financial Review

The financial state of the charity is satisfactory. The bank balance at the end of the year was £12,857. Reserves are necessary to allow the next competition to be planned and launched without relying on having to attract funding to a specific schedule. The reserves include a long standing loan from one of the original founders of the charity. This is not time bound, nor is it interest-bearing.

This year has undoubtedly been very challenging for fundraising because we were not able to run a physical competition this year and the outlook for next year looks very uncertain. Our only income was a small amount received from Google employees through the company charitable donations programme.

A financial statement has been filed alongside this report and the full accounts are available for inspection at any time.

Approved by the board of Trustees and signed on its behalf:

Diane Dowling

Diane Dowling
Trustee (Treasurer)

CHARITY COMMISSION FOR ENGLAND AND WALES

Charity Name	No (if any)
Student Robotics	1163168

Receipts and payments accounts

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For the period from	Period start date	To	Period end date
	01/08/2019		31/07/2020

Section A Receipts and payments

	Unrestricted funds to the nearest £	Restricted funds to the nearest £	Endowment funds to the nearest £	Total funds to the nearest £	Last year to the nearest £
A1 Receipts					
Donations	531	-	-	531	2,135
	-	-	-	-	-
	-	-	-	-	-
	-	-	-	-	-
	-	-	-	-	-
	-	-	-	-	-
	-	-	-	-	-
	-	-	-	-	-
***Sub total**(Gross income for AR)*	531	-	-	531	2,135
A2 Asset and investment sales, (see table).					
	-	-	-	-	
	-	-	-	-	-
Sub total	-	-	-	-	-
Total receipts	531	-	-	531	2,135
A3 Payments					
Accountancy fees	-	-	-	-	525
Bank charges	17	-	-	17	21
Insurance	488	-	-	488	486
Mail services	67	-	-	67	550
Meeting costs	82	-	-	82	397

Web services	850	-	-	850	1,132
Container and kit storage	1,630	-	-	1,630	1,070
Competition costs	1,851			1,851	7,682
Kit updating	339	-	-	339	-
Marketing costs	38	-	-	38	-
Sub total	5,362	-	-	5,362	11,863
A4 Asset and investment purchases, (see table)					
Loan repayment	-	-	-	-	1,600
	-	-	-	-	
Sub total	-	-	-	-	1,600
Total payments	5,362	-	-	5,362	13,463
Net of receipts/(payments)	- 4,831	-	-	- 4,831	- 11,328
A5 Transfers between funds	-	-	-	-	-
A6 Cash funds last year end	17,688	-	-	17,688	29,016
Cash funds this year end	12,857	-	-	12,857	17,688

Section B Statement of assets and liabilities at the end of the period

Categories	Details	Unrestricted funds to nearest £	Restricted funds to nearest £	Endowment funds to nearest £
B1 Cash funds	HSBC	12,857	-	-
		-	-	-
		-	-	-
	Total cash funds	12,857	-	-
	(agree balances with receipts and payments account(s))	OK	OK	OK

Details	Unrestricted funds to nearest £	Restricted funds to nearest £	Endowment funds to nearest £

B2 Other monetary assets

	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

B3 Investment assets

Details	Fund to which asset belongs	Cost (optional)	Current value (optional)
		-	-
		-	-
		-	-
		-	-
		-	-

B4 Assets retained for the charity's own use

Details	Fund to which asset belongs	Cost (optional)	Current value (optional)
		-	-
		-	-
		-	-
		-	-
		-	-
		-	-
		-	-
		-	-
		-	-

Details	Fund to which liability relates	Amount due (optional)	When due (optional)

B5 Liabilities

Loan from member	Unrestricted funds	**8,881**	
		-	
		-	
		-	
		-	

Signed by one or two trustees on behalf of all the trustees

Signature	Print Name	Date of approval
Diane Dowling	Diane Dowling (Treasurer)	09/11/2021