

Gene Jury

Project Report April 2008- May 2009

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1) Project summary:

The Gene Jury project aims to engage children aged between 7 and 14 with bioethical issues surrounding the use of modern genetic technology, via interactive workshops delivered in their school classroom. The “Gene Jury” workshops exploit e-learning technology, particularly the personal response system (clickers). All workshops take the same format, which constitutes an approximately 1 hour powerpoint presentation making use of “clickers” throughout, such that pupils can vote to convey their understanding of the material and their opinions. Interactive games or activities and regular class and group discussions are also used to encourage reflection. Initially the powerpoint presentation introduces the minimum amount of science facts or concepts necessary to understand the issue in hand, and the class are then asked to vote on a bioethical question pertinent to that issue. After this, a number of salient examples or scenarios are considered by the class, before re-voting on the bioethical question. The workshops complement the curriculum, fulfil many of the values identified by the “Curriculum for Excellence”, and are supported by a project website (<http://www.biology.ed.ac.uk/projects/GeneJury/>) providing information, links, resources and a question-asking box for further clarification. There are currently 5 workshops which have been designed to engage children with the issues of genetic testing, pre-implantation genetic diagnosis, genetic modification, whole genome sequencing and DNA privacy, and climate change-associated loss of biodiversity.

- “Build a monster”, targeted at p4-p5
- “Designer babies”, targeted at p6-S1
- “GM,ll fix it?” targeted at p6-S1
- “Whose DNA is it anyway?” targeted at p7-S1
- “Bye bye biodiversity?” targeted at p7-S1

The project is funded in full by grants from the Wellcome trust and the Scottish government and is managed and executed by myself, a University lecturer in genetics, along with various part-time post-doctoral science communicators. Two final year Genetics students (working on their assessed honours projects), four members of the Edinburgh University post graduate science communication team, and a group of first year ecology students have also contributed to this project to date.

In addition to 101 workshops presented prior to Easter 2008, 169 further workshops were presented between April 2008 and May 2009 (listed in Table 6), including 44 workshops in distant locations in Moray, Highlands and Islands, and Dumfries and Galloway. Due to teachers’ requests, 20 of these workshops were presented to children in S2 and even S3, while 79 of the workshops were presented to S1 pupils. A further 15 workshops were presented at Our Dynamic Earth (ODE) between April 2008 and June 2008 where 3 of our workshops are offered via summaries included in the ODE educational literature. In 2009 we provided a new set of “Teachers’ tools” which are designed to complement the

curriculum and support science activities within the classroom and which are freely available from our website. The tools include powerpoint presentations on 3 separate topics (each supported with extensive teachers' notes), videos for classroom use and a simple genetics game which can be played in the classroom by pupils at a variety of stages.

2) *Feedback from participants and observers:*

Our ongoing evaluation demonstrates a continued positive response to the project by children, teachers and academic colleagues alike. In 2008-2009 we commissioned 2 further external evaluative reports; one secondary school teacher to evaluate S1 and S2 workshops and one newly qualified teacher (with significant Gene Jury experience) to evaluate our newest workshop as well as the newly provided "Tools for schools" resources on our website.

As in previous years, the children and teachers were asked to rate their opinion of each workshop session, and on a new rating scale of 1-5 (1 being least enthusiastic and 5 most enthusiastic), 81% of children chose option 3 and above with 47% choosing option 5. The numbers of responses in each category for each age group and workshop are shown in tables 1-5.

Table 1: Pupils rating for "Whose DNA is it anyway" on a scale of 1-5

DNA			
	P7 (n)	S1 (n)	Total (%)
1	2	27	16.2
2	1	13	3.9
3	7	16	16.5
4	2	37	15.8
5	20	98	47.6
Totals	32	191	100

Table 2: Pupils rating for "Build a monster" on a scale of 1-5

Monsters		
	Scifest (n)	Total (%)
1	4	4.2
2	2	2.1
3	8	8.4
4	24	25.3
5	57	60
Totals	95	100

Table 3: Pupils rating for “Designer Babies” on a scale of 1-5

Designer babies				
	P7 (n)	S1 (n)	S2 (n)	Total (%)
1	9	80	9	13.9
2	3	29	0	5.0
3	14	72	5	13.4
4	29	108	1	21.4
5	49	247	7	46.3
Totals	104	536	22	100

Table 4: Pupils rating for “GM’ll fix it?” on a scale of 1-5

GM				
	S1 (n)	S2 (n)	Sci fest (n)	Total (%)
1	19	22	5	19.6
2	4	8	2	4.1
3	12	12	9	12.4
4	29	14	10	29.9
5	33	34	18	34.0
Totals	97	90	44	100

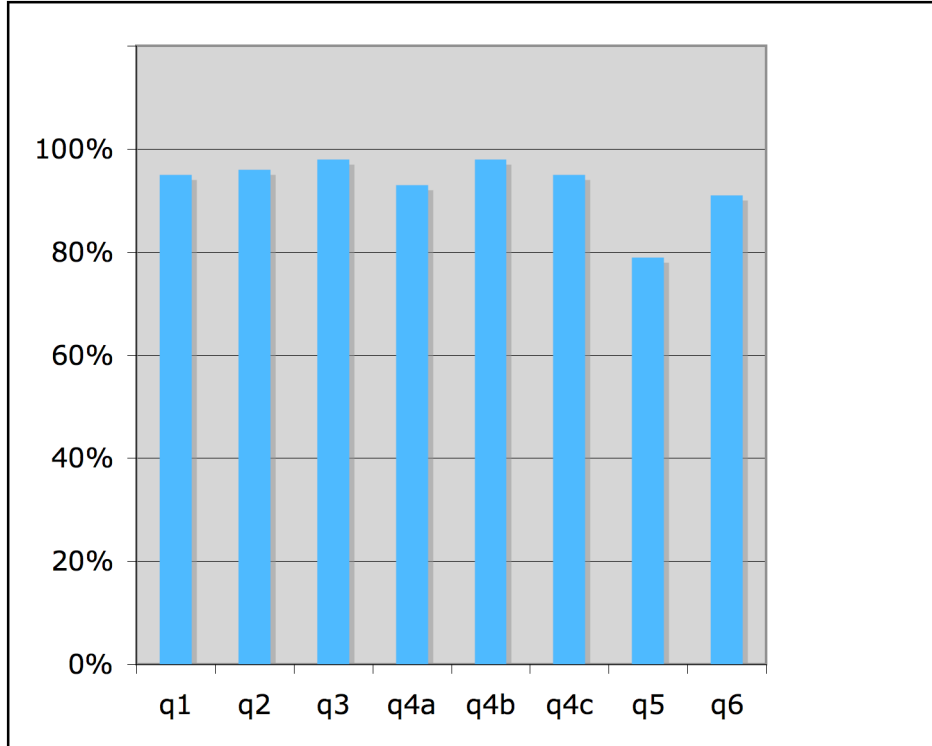
Table 5: Pupils rating for “Bye bye biodiversity?” on a scale of 1-5

Climate change				
	P7 (n)	S1 (n)	Scifest (n)	Total (%)
1	2	20	6	9.6
2	2	15	3	6.8
3	6	21	2	9.9
4	13	35	9	19.5
5	14	101	43	54.1
Totals	37	192	63	100

Teachers were also asked to rate their agreement on a scale of 1-5 with a series of 8 supportive statements (supplied in Figure 1). Agreement with 7 of the 8 statements was greater than 90% while statement 5 scored 79%. This statement concerns grasping the scientific content and acknowledges the complexity of the topics being covered. Written comments were also solicited from both children and teachers. Constructive criticisms were reviewed for project development whilst the majority of comments affirmed enjoyment and usefulness of the workshops. Examples would include; “*Excellent curriculum for excellence ideas - more would be welcome*” – S1 teacher, “*Loved the interactive activities and group work. Pupils responded very well to everything and*

seemed to enjoy it. Challenged pupils thinking at an appropriate level. I really enjoyed it - thank you!"-S1 teacher, "I liked how we got to participate, it was awesome!"- S1 pupil.

Figure 1: Teachers evaluation questions (all workshops, n=117-207).



1. How enjoyable did you find the session?
2. How interesting did you find the session?
3. How would you feel about further visiting workshops of a similar nature in the future?
- 4a. How did you think the children coped with the teaching style of the presentation?
- 4b. How did you think the children coped with the teaching style of the clickers?
- 4c. How did you think the children coped with the teaching style of the game?
5. Did you feel that the children were engaged with the scientific concepts in the workshop?
6. Did you feel that the themes discussed in the workshops were appropriate for the age of the children?

Table 6: Gene Jury workshops, April 2008 –May 2009 (169 workshops)

<u>Location</u>	<u>Workshop (n presentations)</u>
Dalry Primary, Edinburgh	Build a monster (3)
Dalry Primary, Edinburgh	Designer Babies (2)
Tynecastle Secondary, Edinburgh	Whose DNA is it anyway? (3)
12 th Midlothian scout group	Whose DNA is it anyway? (1)
James Gillespie Secondary, Edinburgh	Designer Babies (10)
St Joseph's College, Dumfries	Designer Babies (8)
Maxwelltown High, Dumfries	Designer Babies (4)
Moffat Academy, Dumfries	Designer Babies (2)
Hawthornden Primary, Midlothian	Build a monster (2)
Dalry Primary, Edinburgh	GM'll fix it? (2)
King's Park Primary, Midlothian	Build a monster (2)
King's Park Primary, Midlothian	Designer Babies (2)
Comely Park Primary, Falkirk	Build a monster (4)
Abronnill Primary, Cumbernauld (ODE)	GM'll fix it? (1)
Carnegie Festival of Imagination, Dunfermline	GM'll fix it? (2)
	Whose DNA is it anyway? (1)
Holyrood High School, Edinburgh	Whose DNA is it anyway? (6)
Holyrood High School, Edinburgh	Designer Babies (4)
Holyrood High School, Edinburgh	GM'll fix it? (9)
Moffat Academy, Dumfries	Designer Babies (2)
Moffat Academy, Dumfries	Whose DNA is it anyway? (1)
James Young High, Livingstone	Designer Babies (9)
Milnes High School	Whose DNA is it anyway? (6)
Buckie High School	Whose DNA is it anyway? (3)
Buckie High School	Designer Babies (4)
Buckie High School	GM'll fix it? (3)
Bo'ness Academy	Designer Babies (4)
Dennie High School	Designer Babies (13)
Dennie High School	GM'll fix it? (8)
Tynecastle High School	Bye bye biodiversity? (2)
Royal High school	Bye bye biodiversity? (1)
Royal High school	GM'll fix it? (6)
Royal High school	Designer Babies (4)
Portree High School	Designer Babies (2)
Portree High School	Bye bye biodiversity? (6)
Plockton High School	Bye bye biodiversity? (3)
Sciennes Primary, Edinburgh	Designer Babies (3)
Sciennes Primary, Edinburgh	Bye bye biodiversity? (3)
Oxgangs Primary School	Designer Babies (2)
Edinburgh Science festival	Build a monster (8)
Edinburgh Science festival	Bye bye biodiversity? (8)