Overall evaluation of the project

July 2015

Champions for Wind

Project Evaluation

Contents

Summary

The final evaluation for the Champions for Wind project is based on 464 pupils (questionnaires and focus groups) aged 9 - 15 and 41 teachers (questionnaires and interviews) from 2012 - 2015.

The results indicate that pupils' knowledge of the offshore wind industry, Dogger Bank and related careers significantly increased after the programmes had been delivered in their schools. In addition, pupils' desire to work in the offshore wind industry also increased and pupils' interest to learn more about the offshore wind industry, Dogger Bank and related careers also statistically significantly increased. Few sex differences in knowledge and interest were found and those that were revealed were mostly in favour of boys but with some unexpected sex differences in favour of girls in relation to an interest in working in the offshore wind industry.

Teachers reported that they had very much enjoyed working with the pupils on this project and commented that it had increased their knowledge of the offshore wind industry. They reflected on their professional development and reported that their confidence to deliver new material in their curriculum area had increased as a result of designing teaching materials for this project. Indeed, the increase in knowledge and interest reported by the pupils is evidence that teachers' knowledge and confidence to deliver in this subject area did increase. Teachers also reflected on the effect that taking part in this project had had on their professional development.

The results suggest that the educational programmes delivered in schools resulted in the increases in knowledge and confidence in teachers in addition to increases in knowledge of, and interest in, the offshore wind farm industry for pupils.

Acknowledgements

Many thanks to the schools, Teacher Champions and all pupils for their involvement in the evaluation.

Schools involved (in alphabetical order):

Ashwell PRU

Bydales School

Caedmon School

Cleveland and Redcar College

Cottingham High School

Driffield School

Dyke House School

Eskdale School

Graham School

Hessle Federation

Kelvin Hall School

Kirkleatham Hall

Lawrence Jackson School

Malet Lambert

Oases School

Redcar Academy

Ryehills School

Scalby School

St Anne's CE Primary

St Hilds School

St Peters School

The Boulevard Academy

The Snaith School

Withernsea High School

Evaluation carried out by:

Dr Myfanwy Bugler, University of Hull

The evaluation of the Champions for Wind education programme received ethical consent from the Department of Psychology Ethics Committee, University of Hull.

Rationale for the project

The aim of the Forewind 'Champions for Wind' project was to raise awareness amongst primary and secondary pupils of the potential career opportunities in offshore wind energy and to inculcate an understanding of the qualifications and experience required to gain employment in the industry. A total of 24 Secondary, Primary and Special Educational schools in Teesside, Hull and the East Riding of Yorkshire have been involved in the project over the last four years with 41 'teaching champions' and 464 pupils. These schools were chosen due to their proximity to Forewind's development of the offshore wind farm at Dogger Bank.

Each teacher "champion" worked with careers advisors and wind industry representatives, to design and develop a curriculum-based resource relevant to their local area and appropriate to their school and focused on the opportunities offered by the offshore wind industry. The teachers delivered their resources within their own school in the first year of the project in 2012, they then disseminated these resources over the following school year to colleagues both within their school and in neighbouring schools. This continued as new schools engaged in the project so that resources were shared both within and across schools throughout the area. These resources were designed to be used both by the teaching champions and other teachers and to be future-proofed by being continually developed and updated and eventually embedded in the curriculum in some subject areas.

By facilitating careers education for young people in the area around the Dogger Bank projects' onshore infrastructure, Forewind aimed to meet the needs of the local community whilst also supporting the wind industry by boosting the number of motivated young people entering into it. The objectives of the programme included: promoting gender balance in science subjects such as technology, engineering and mathematics as well as in future careers; roundedness of the industry; pride, a sense of ownership and skills development in the local area; innovation; providing a vision for the future; building on any existing programmes fostering teacher development, and having a robust evaluation methodology.

In order to assess the affect of this educational programme on the pupils it was necessary to gain some understanding of their knowledge and interest in the industry prior to start of the project. To this end pupils were asked to complete two questionnaires one pre-programme and one post-programme to assess the extent of their knowledge and interest in the offshore wind industry.

Professional development of the teachers involved in the project was also an area of interest. The aim was to encourage and support teachers to develop new resources to deliver information about careers and the required qualifications needed to seek employment in this industry. The aim was to assess whether there was a measurable

increase in their confidence in their ability to create and deliver new teaching resources, which would promote both career development and personal development, and whether there was an increase in their knowledge of careers within the offshore wind industry. To assess the change in teachers' knowledge and confidence they were also asked to complete two questionnaires, one pre-programme and one post-programme.

The aim of this report is to give an overview of the whole project and its effect on pupils' knowledge and interest in the industry, and the available career paths in offshore wind farms. In addition, this report aims to assess the effect of this project on teachers' confidence in producing teaching materials, knowledge of careers within the industry and on their professional development.

Summary of evaluation for 2012, 2013 and 2014

Pupil questionnaire (this was used for all three cohorts and results were reported in the evaluation documents for 2012, 2013 and 2014)

The pre and post programme pupil questionnaire examined three areas of interest. The first related to pupil's knowledge about the offshore wind industry, Dogger Bank, and related careers. Pupils were questioned on their knowledge of more familiar concepts (i.e., renewable energy and wind farms) before being asked more specific questions assessing their knowledge of the offshore wind industry and Dogger Bank.

Please see the Appendices for copies of these questionnaires.

Pupil questionnaire

Q1. I know what renewable energy is
Q2. I know how wind farms work
Q3a. I know about careers in the OWI
Q3b. I know about the Dogger Bank offshore wind farm
Q3c. I know about the careers available at Dogger Bank
Q4a. I what a company needs to do: Gain Permission
Q4b. I know what a company needs to do: Construct OWI
Q4c. I know what a company needs to do: Long term mgt
Q5a. I know about career opportunities: Gain Permission
Q5b. I know about career opportunities: Construct OWI
Q5c. I know about career opportunities: Long term mgt
Q7. I know about qualifications and experiences: OWI

Knowledge

The second area related to pupils' interest to learn more about the offshore wind industry, Dogger Bank, and related careers. In addition, pupil's desire to pursue a career in this area.

Q8. I would like to work in the OWI
Q10. I am interested to learn more about wind farms
Q11. I am interested to learn more about the OWI
Q12. I am interested to learn more about careers in the OWI
Q13. I am interested to learn more about Dogger Bank
Q14. I am interested to learn more about careers at Dogger Bank

Interest

The third area related to pupil's perceptions of the offshore wind industry, specifically examining whether only a narrow range of careers would be identified as relevant for this industry. In addition, preconceptions about the traits necessary to work in the area (e.g., more masculine than feminine traits) was also examined

Q6. Careers related to the OWI
Q9. Important personal qualities to work in the OWI

Preconceptions

Teacher questionnaire

The same Teachers' questionnaire was used for all three cohorts and results were reported in the evaluation documents for 2012, 2013 and 2014.

It was predicted that teachers' knowledge and confidence as educators would increase in the following areas:
The first area related to teacher's knowledge about more familiar topics (i.e., renewable energy and wind farms), before extending to the offshore wind industry and careers in the industry.

Renewable energy
Wind farms
Offshore wind industry (OWI)
Forewind/Dogger Bank
Careers in the OWI
Qualifications necessary for careers in the OWI
Experience required to gain employment in the OWI

Knowledge

The second area related to teacher's confidence to create and deliver an education programme relating to these topics. In other words, teachers would probably feel more confident that they could effectively communicate this information to their pupils.

Renewable energy
Wind farms
Offshore wind industry (OWI)
Careers in the OWI
Qualifications necessary for careers in the OWI
Experience required to gain employment in the OWI

Confidence to create and deliver an education programme

The third area related to background information from the teacher, for example, involvement in previous education programmes etc.

Further information (e.g., reasons for getting involved, which areas of the curriculum, previous involvement in Education programmes, career guidance role within school)

Background and Additional info

Forewind champions for Wind Project 2012

The Champions for Wind 2012 evaluation was based on one hundred and ninety eight pupils (aged 12 – 15) and nine teachers within nine secondary schools. Pre and post programme questionnaires were completed by pupils and their teachers and focus groups were carried out with a sub-sample of pupils (n = 35) and teachers (n = 3) after the programmes had been completed.

Pupil's knowledge about the offshore wind industry and related careers significantly increased after the programmes had been delivered in their schools. Increases in pupil's interest to learn more about the offshore wind industry, related careers or pursue a career in the industry also increased, although these differences were less consistent. Sex differences in knowledge were wider prior to the programme than after the programme, with boys consistently reporting greater knowledge. Sex differences in interest were similar before and after the programme, with boys reporting greater interest. Teacher's also reported a significant increase in knowledge and confidence to deliver an education programme relating to the offshore wind industry and related careers after the programme.

Focus groups and additional comments by pupils and teachers revealed insight into how to proceed with this in the future. To maximise impact, it was suggested that pupils learn about career opportunities in offshore wind industry through a variety of learning methods; this is likely to be most popular among pupils and lead to increased interest. Indeed, increasing interest and reducing sex differences in interest are likely to be the greatest challenges in the future. It was also suggested that future Teacher Champions are carefully selected (given the passion and commitment necessary to be involved this project) and well supported (via professional dialogues among Teacher Champions and sharing of resources).

This evaluation suggests that successful offshore wind educational programmes were delivered in all schools which resulted in the development of knowledge and confidence for all teachers and increased knowledge for all pupils. Generating interest among pupils appeared to be more difficult than developing knowledge and this was likely to be a challenge to future projects.

Forewind champions for Wind Project 2013

The Champions for Wind evaluation 2013 was based on 137 pupils (questionnaires = 117, mind maps = 20) aged 12 – 15 and 15 teachers (questionnaires/interviews).

Pupil's knowledge of the offshore wind industry, Dogger Bank and related careers significantly increased after the programmes had been delivered in their schools. In addition, pupil's desire to work in the offshore wind industry increased. However, pupil's interest to

learn more about the offshore wind industry, Dogger Bank and related careers did not increase statistically. Few sex differences in knowledge and interest were found; however sex differences that were present were in favour of boys.

Teacher's reported a significant increase in knowledge and confidence to deliver an education programme relating to the offshore wind industry and related careers after the programme had been completed. Indeed, the professional development of the teachers involved is crucial, as these teachers will be responsible for teaching future cohorts of pupils. Most teachers also made very positive comments about what they had learnt and gained personally from being involved in the programme and provided advice to future Teacher Champions.

This evaluation suggests that the educational programmes resulted in the development of knowledge and confidence for all teachers and increased in knowledge for pupils; generating interest among pupils was more difficult.

Forewind champions for Wind Project 2014

The Champions for Wind evaluation 2014 is based on 129 pupils (questionnaires = 258) aged 9 - 15 and 17 teachers (questionnaires).

Pupil's knowledge of the offshore wind industry, Dogger Bank and related careers significantly increased after the programmes had been delivered in their schools. In addition, pupil's desire to work in the offshore wind industry also increased and pupil's interest to learn more about the offshore wind industry, Dogger Bank and related careers also statistically significantly increased. Few sex differences in knowledge and interest were found and those that were revealed were mostly in favour of boys but with some unexpected sex differences in favour of girls in relation to an interest in working in the offshore wind Industry.

Teachers reported that were very much looking forward to engaging in the programme to increase their knowledge of the Offshore Wind Industry. They reflected on their professional development and hoped that the programme would increase their confidence to deliver new material in their curriculum area. Indeed, the increase in knowledge and interest reported by the pupils is evidence that teachers' knowledge and confidence to deliver in this subject area did increase. Professional development is important for these teachers as they will be responsible for teaching future cohorts of pupils.

This evaluation suggests that the educational programmes resulted in the development of knowledge and confidence for all teachers in addition to increases in knowledge and interest among pupils. The increase in interest in working within the offshore industry evidenced in this evaluation may be a reflection of the increase in teachers' increased knowledge of the careers available in this industry.

Changes in pupils' knowledge and interest post programme reported in 2014

Initially, analysis was carried out to measure changes in knowledge and interest from pre to post programme for all pupils included in the evaluation. Interestingly these results indicated an increase in motivation as the pupils' interest has increased significantly towards the offshore wind industry both in terms of possible future employment and in finding out more about the industry and how it functions.

Sex differences

Analysis was carried out to examine sex differences in the pre and post programme responses. In addition, changes in boys and girls knowledge from pre to post programme are also reported.

Sex differences prior to the programme

In the pre programme questionnaire, some sex differences were found; statistically significant sex differences were found in 5 out of 14 questions pre programme.

Sex differences after the programme

Boys: Changes from pre to post-programme

Boys' knowledge about and interest in the offshore wind industry increased for all questions. Boys also stated that they would be more likely to want to work in the offshore wind industry after the programmes had been completed.

Girls: Changes from pre to post-programme

Girls' knowledge about and interest in the offshore wind industry increased for all questions. Girls stated that they would be more likely to want to work in the offshore wind industry after the programmes were completed.

Correlations between pre and post-test responses

The results illustrated that there was not a linear increase in pupil's knowledge and interest, but individual differences; some pupil's knowledge and interest developed to a greater extent than others. There were no associations between pre and post-test. These results suggest that pupils' knowledge and interest are flexible and open to educational change. Therefore education may play a major role in increasing pupil knowledge and interest in new industries.

Change in pupils' knowledge and interest between cohort 2 and cohort 3 (2013 and 2014)

It was of interest to ascertain whether there had been an effect on pupil knowledge and interest in the offshore wind industry as a result of taking part in the project. To that end

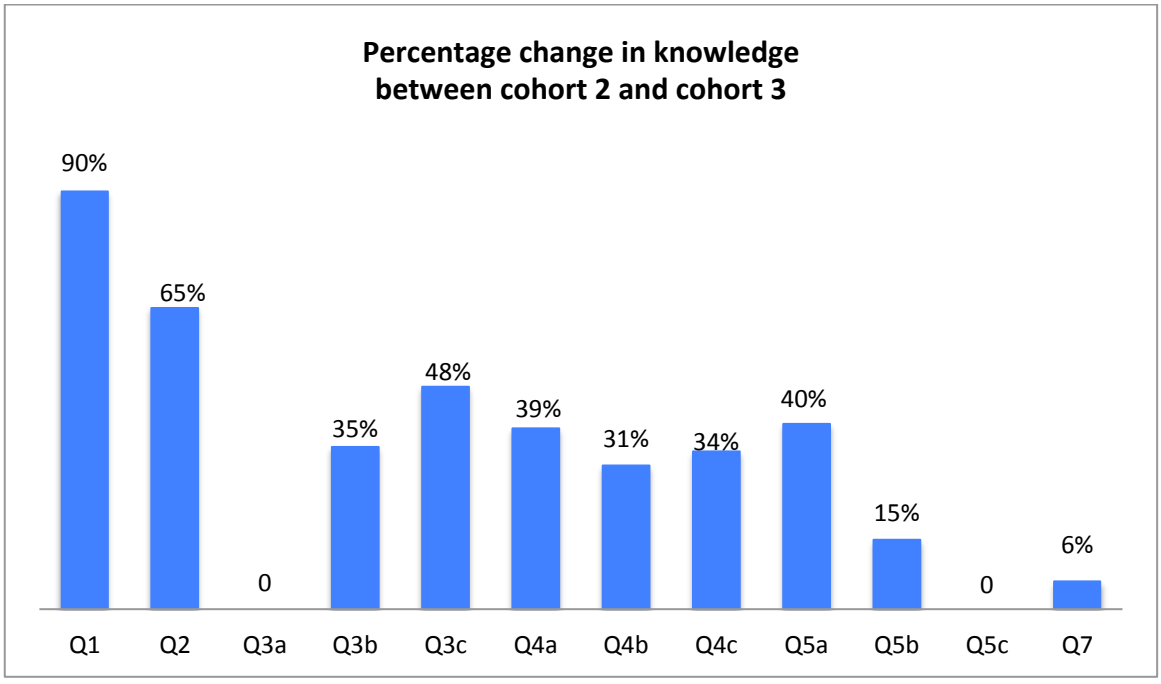
analysis was carried out to investigate whether knowledge of, and interest in, the offshore wind industry had increased in participating pupils due to the dissemination of teaching materials created by partner schools. In addition, analysis was carried out to investigate whether knowledge in the offshore wind industry and confidence to create teaching materials, and to deliver a programme based on this industry, had increased in participating teachers.

Data used to determine the percentage change in knowledge, interest and confidence were the t-test size of increase reported in cohort 2013 and 2014 (2012 used different questionnaires so this data was not used to establish percentage change between 2012 and 2013).

For pupils there was a significant percentage change in knowledge (see Graph 1) and interest (see Graph 2) between cohort 2 (2013) and cohort 3 (2014).

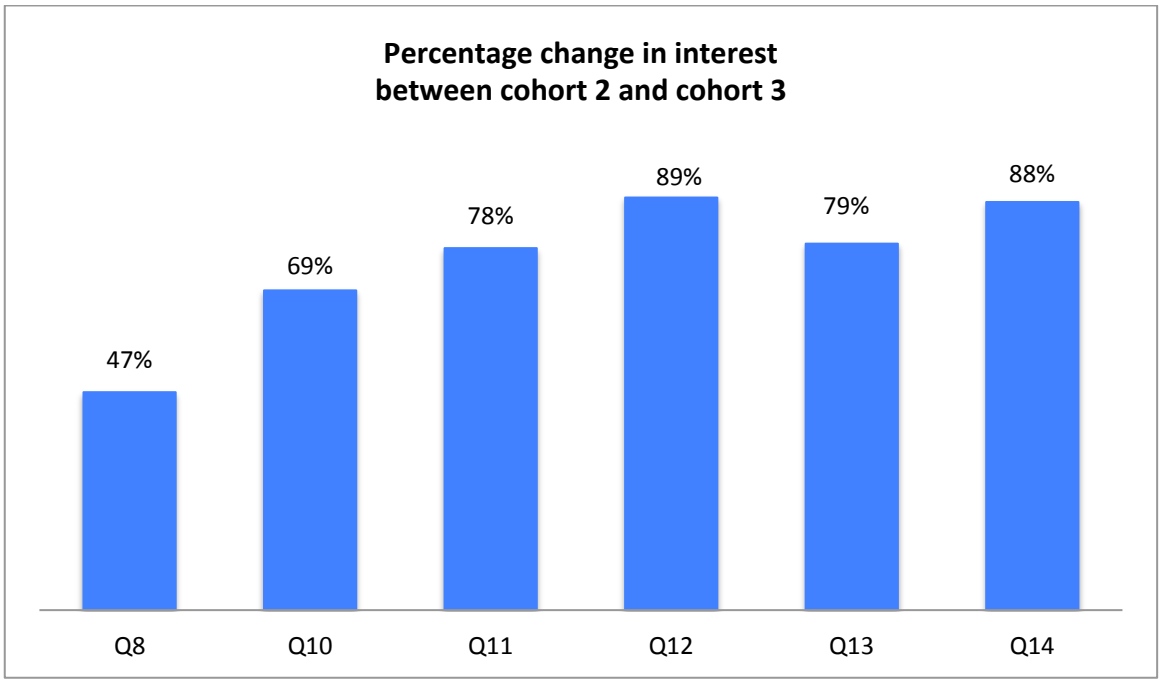
Percentage change in knowledge and interest between cohort 2 (2013) and cohort 3 (2014)

Graph 1. Percentage change in knowledge between cohort 2 (2013) and cohort 3 (2014)



There was a significant percentage increase in knowledge for pupils from 2013 to 2014 for most questions apart from Q3a and Q5c. Both these questions refer to knowledge of careers within the offshore wind industry. It would appear that the pupils had a sound knowledge of this area so no increase in knowledge was evident between both cohorts.

Graph 2. Percentage change in interest between cohort 2 (2013) and cohort 3 (2014)



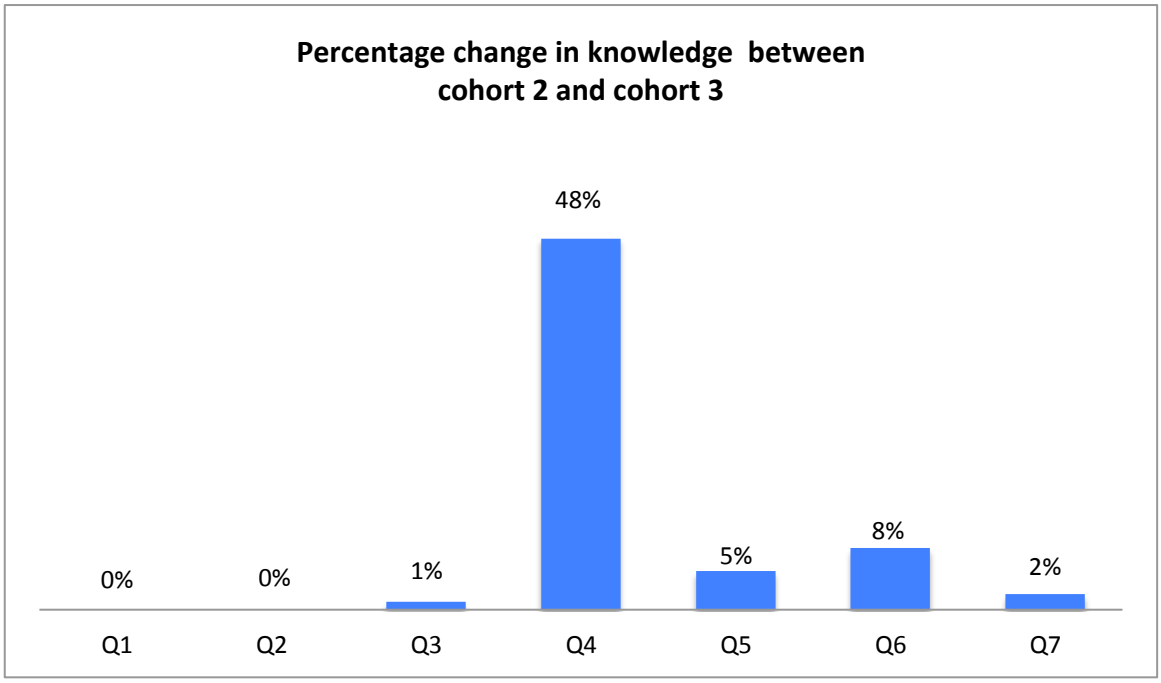
There was a significant percentage increase in interest in the offshore wind industry for pupils between cohort 2 and cohort 3. This could be due to better teaching materials, an increase in teacher knowledge of careers within the offshore wind industry or general publicity within the schools and media about renewable energy.

Change in teachers' knowledge and confidence between cohort 2 and cohort 3 (2013 and 2014)

It was interesting to note that the teachers' knowledge about the offshore wind industry, and their confidence to create teaching resources, and deliver programmes in this field, increased. These increases were statistically significant except for two questions (questions 1 & 2), which showed an increase in knowledge and confidence but this increase was not significant. Overall the trend was definitely positive in favour of increase in knowledge and confidence.

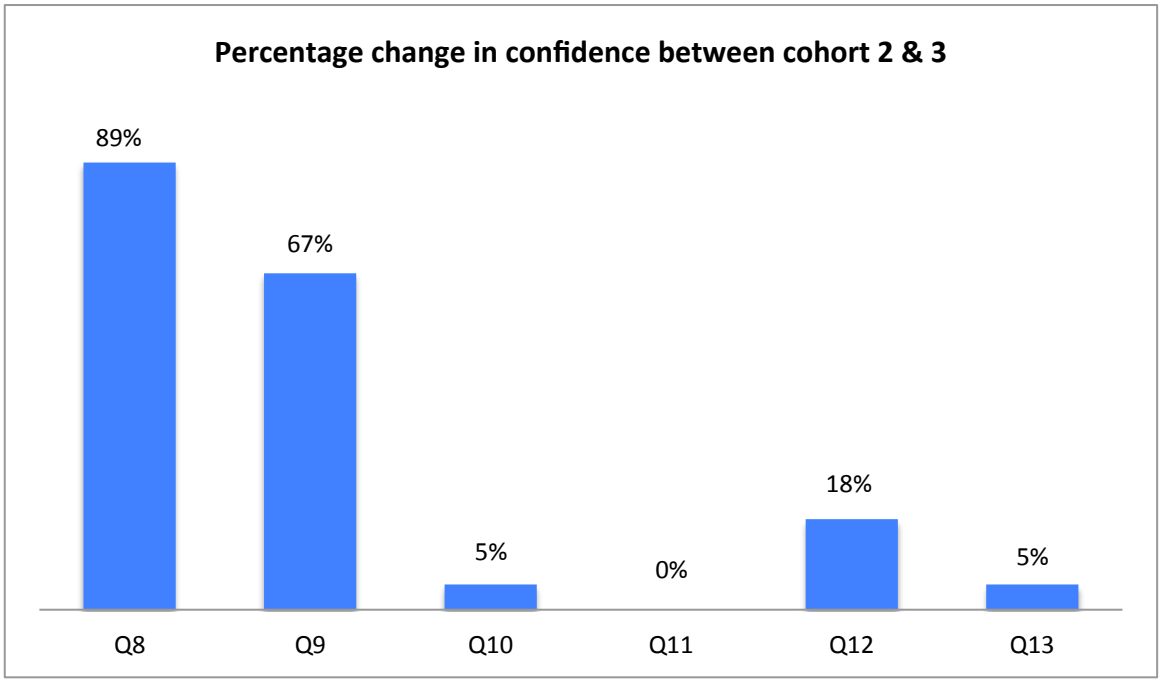
For teachers there was a significant percentage change in knowledge (see Graph 3) and confidence (see Graph 4) to create teaching materials and deliver a programme about the offshore wind industry between cohort 2 (2013) and cohort 3 (2014).

Graph 3. Percentage change in knowledge between cohort 2 (2013) and cohort 3 (2014)



There was a significant percentage increase in teachers' knowledge between cohort 2 and cohort 3 for most of the questions with the exception of Q1 and Q2. Question 1 and Question 2 relate to knowledge of renewable energy and wind farms which teachers probably had a very good knowledge of already so would therefore show no increase in knowledge.

Graph 4. Percentage change in confidence to create materials and to deliver a programme based on the offshore wind industry between cohort 2 (2013) and cohort 3 (2014)



There was a significant percentage change in teachers' confidence to create teaching materials and to deliver a programme about the offshore wind industry with the exception of Question 11. Again teachers would probably have a reasonable idea of the careers available in the offshore wind industry so change was evident for this question.

Analysis of effectiveness of the whole project (2012-2015)

Pupil focus group interviews June 2015 after the Forewind project had finished.

A focus group of pupils in Year 10 (15yr olds) were asked to reflect on their experience of the project. These pupils were in the first cohort (2012) and it was of interest to ascertain whether their career aspirations have been influenced as a result of taking part in the project. Their reflections are cited below:

What five personality qualities do you think might be important to work in the offshore wind industry?

These were the most common answers:

Leadership, trust, intelligence, resourcefulness, responsibility, strength, teamwork, communication, creative, independent, an environmental conscious, hard working, perseverance, resilient, reflective, patience, good with hands, motivated.

Overall, the qualities suggested by pupils were positive traits, not necessarily related specifically to the offshore wind industry. In addition, pupils did not necessarily focus on academic skills (although there was reference to this by some).

Write a list of all the careers you think might be needed to work in the offshore wind industry.

These were some of the more common answers:

Engineer, builder, technician, manager, welder, pilot, crane technician, crane driver, health and safety officer, accountant, painter, planner, ethologist, scientist, designer, marine biologist, caterer, diver, drill operator, medic.

Interestingly, more careers were listed by pupils in this questionnaire than in the previous evaluations conducted in 2012, 2013, and 2014. In addition, these questionnaire responses generally reflected a much better understanding of the potential careers available in this industry.

How did the project impact on you?

It helped me to understand how the offshore wind turbines worked and showed me career options that I wasn't aware of (girl).

Previously I was only aware of the negative impacts of wind farms so after the project I was surprised to find that in my opinion that the positive points out-weighed the negative (girl).

It had a good impact on me because it made me think whether I would rather have lights on or lights off. Wind turbines are not very nice to look at but they will make a difference by generating electricity for us. It makes you think what would you do without energy? The wind farms create lots of jobs (boy).

It had a good impact on me because it opened my eyes to the massive opportunities there are involved with the offshore wind industry and how lucky we were to know that there will be jobs available for us when we have finished our education (boy).

It helped me to understand that there are jobs out there that are related to the project for both boys and girls. There's 1200 jobs available related to the offshore wind farm (girl).

The initial setting up of the offshore wind farm didn't impact me a lot however, learning about it in school opened my eyes to the amount of jobs that will be available in the offshore wind farm (girl).

The project made me realise that there are a lot of opportunities to have the career that I want. I want to be an engineer or a welder. This made me realise that I could have that career if I wanted and if I worked hard enough to get it (boy).

Did the project extend your knowledge of future career aspirations?

Yes because it showed and helped me get an understanding of alternate job options that I didn't know about of had not thought of doing (girl).

Yes I feel it did because I've never realised how many other jobs there are that are exciting and connected to this project (girl).

It extended my career aspirations a lot because you wouldn't have thought that there would be so many engineering jobs out there (boy).

Yes it did because it made me realise how much money and effort is involved with wind turbines (boy).

It helped by showing me career options that I hadn't heard about or been told about (girl).

It didn't make me want to change my future career aspirations but it did show me that there is a lot of opportunities for jobs around here now (girl).

It made me think about what I wanted to do as a career and about any opportunities that may arise (boy).

Did the project enable you to learn new skills?

I learned skills that are important in future careers. More writing skills involved in these other job options (girl).

It helped me to debate, to do graphs, built my confidence and developed my ability to understand and listen to the opinions of other people (girl).

Yes because it made me knowledgeable about the offshore wind turbines. Also I learnt about marine biologists and the job that they do (boy).

Yes because it made me much more knowledgeable about the industry and the skills I needed to be able to work in that industry (boy).

Taught me graphing skills (girl).

It helped me adapt the skills that I already have. It also helped me realise that things can be just as good closer to home (girl).

Yes because it informed me about what the offshore wind industry is looking for in terms of employees and what I need to learn and achieve in order to obtain a position there (boy).

Did the project enable you to consolidate learning of existing skills through the way that the project was developed and delivered in your school?

It enabled me to build on my communication skills, both speaking and written and to adopt team-working skills. It also helped me to develop graphic skills (girl).

It opened my mind to be able to consider other people's opinions but also built my confidence to earn how to debate. Also knowing that you have to be aware of all impacts before making a final decision about something. Overall these skills can build on my life decision and being able to understand others which has made me feel more mature (girl).

Yes because the skills we learnt in the geography lessons helped us in other subject areas such as maths and English (boy).

Yes because the skills were easy to apply to the lessons when we were working in a group and answering questions. My graph skills increased as did my communication skills. Also this helped me with maths and English (boy).

Helped me develop team-working skills (girl).

It helped me learn about debates and helped me adapt me learning skills such as drawing graphs and collecting data in questionnaires (girl).

It helped me with gathering public opinion and how to take that into consideration when thinking about a career, especially a career that would have a big impact on the community (boy).

Summary of pupils' reflections

Pupils, boys and girls, reported that as a result of being involved in the FOREWIND project they had a greater understanding of the careers available in the OWI and the qualifications required to work in the various jobs that are available. They also reflected on the teaching resources that were created to deliver the programme in schools and stated that these resources had allowed them to develop new skills e.g. communication (written and oral), graphing skills, team-working skills, and data gathering. Pupils also felt that these skills transferred to other areas of the curriculum such as maths and English. They viewed the project as a very positive contribution to their overall educational experience.

Teacher interviews June 2015 after the Forewind project had finished

Teacher interviews were carried out with some of the Teacher Champions. The interview questions were designed to find out about the teachers own professional development after being involved in this project, their feelings about the project and their advice for potential future.

Did you attend the initial conference? If so, can you tell me your thoughts about the initial conference?

Yes- very positive in meshing the interests of education and the offshore wind industry. First contact with people in the offshore wind industry. – very positive sense of engagement.

Yes. Excellent. The Conference was really informative both in terms of the renewables industry, and also company information in relation to Forewind & OSW Energy.
The initial conference was informative and contained lots of relevant content. It was also great to have access to industry specialists.

Yes. It was very informative and an excellent opportunity for networking. I really felt like it set the tone for the project and allowed us the ability to begin with initial thoughts to do the project.

What, if anything, do you think you have learned from being involved in this project?

Wide range of curriculum backgrounds of people involved in the industry. Interesting to see the 'project' nature of the work that industry people sign up to for 3-5 years with no guaranteed idea of what follows. Worthwhile chance to meet professionals from private industry to see their ethical attitude towards environmental stewardship and community participation.

I have learnt a lot of things about the offshore wind industry and I'm sure I have only scratched the surface of what there is to know. It was interesting to find out about some of the careers available, the planning that goes in to a wind farm and the technicalities of the turbines.

The renewables sector, and in particular the wind industry, is more than just the building of the actual wind turbines. The "off-shoot" industries, including hospitality and environmental protection also create numerous job opportunities for the wider community.

The politics in the UK are far more "restrictive" than our German / Dutch counterparts and unless "we" are careful our European colleagues will capitalise on the wind industry at the UK's expense.

I have learned more about STEM, the wind industry and opportunities for employment in the renewables sector. I have also learned the important of incorporating real life learning into my teaching practice. Enabling pupils to work on projects linked to careers and employability.

I now have a greater understanding of the employment opportunities within the industry and how best to communicate these across to the pupils. This has also been fed back into our careers department and integrated within the future planning process.

What, if anything, do you think you have gained from being involved in this project?

Networking with other teachers in the area/other subject areas/cross phase. Getting involved with HETA and seeing how this is a very valid route forward for many pupils. Continuing to work with HETA and Wind Champions in subsequent initiatives in education.

I found it very useful to be able to access information that I might otherwise have not known about. The financial support from the project meant that we could buy in resources that were suitable to the level of pupils that were part of the project.

A clearer understanding of the science, job opportunities and politics of the renewables sector.

A better understanding of STEM etc. I have also gained a network of teachers, leaders and experts in this field.

One of the biggest challenges for me was creating a whole project and managing the staff both internal and external volunteers etc and the budget. I now know how to create a large scale project and manage it appropriately.

Which aspect has been the most satisfying?

Working with the department to develop the scheme of work and resources. Sharing with other colleagues at Wind Champion conferences. Seeing pupils (Y8) perspectives change on offshore engineering and the types of roles, capacities and subject routes that may contribute – and be gender neutral.

The knowledge that the pupils gained and the fact that they could access practical equipment as a direct result of the funding.

Gaining a clearer understanding of the science and the wide variety of job opportunities.

The opportunity to work with industry experts as well as great teachers. Another area that was most satisfying was being able to collaborate and share practice, this has improved my teaching and learning.

Being involved in the final project and reading through the evaluations of the pupil and staff impressions.

Which aspect has been the least satisfying?

Becoming increasingly frustrated with civil servants and the "politics" of making this happen!

Which aspect has been the most challenging?

Creating the time to produce the resources and scheme of work.

Deciding which resources would best suit the needs of our learners and trying to be forward thinking enough to make sure that they were relevant for pupils accessing them in successive years that the programme would be delivered.

Generating whole school interest in the project – many have pre-conceived opinions on the wind industry.

The area that was most challenging included embedding the lesson with other teachers. Sometimes it was also difficult to get out of lessons for the training due to in School demands and pressures.

Can you reflect on the impact that the project had on your professional development?

Kept me professionally sharp and active in the later stages of a Head of Department career. Opened up significant areas for my subsequent work in retirement. Created contacts for subsequent professional work.

Personally I gained a lot of confidence from developing the programme within school and having the opportunity to feed back to the senior management team. I found the STEM Centre conference great for exploring other ways that schools had developed their programmes.

Very positive – incredibly worthwhile and inspiring project.

This project has enabled me to grow both as a teacher and leader. This project gave me confidence to deliver training, share good practice and think about how I deliver aspects of the IT curriculum. I attribute my current role as an Assistant Headteacher down to the key principles of this project. Real life learning, links to academic research and industry links. I am still in contact with teachers who worked on projects and am very grateful of the opportunity.

Can you reflect on the impact that the project had on your teaching ability?

Made me far more gender conscious of messages we give to pupils. More appreciative of engineering and the need for engineers and also of the subjects that lead to a career in engineering. Collaborative planning of teaching materials is far more effective in engaging the rest of the department to committed teaching of the material.

Having appropriate resources meant that I could teach what I felt was necessary rather than having to adapt lessons to what resources were available.

Good. Made me think more creatively and enhanced my technological skills.

This project links to the book I read recently by Ron Berger entitled 'An Ethic of Excellence'. By giving pupils the opportunity to learn about 'real life' projects, this enables excellent learning opportunities. The project made me think about how I deliver the curriculum and also look at opportunities to develop links to STEM, CEIAG in practice.

I feel I now try to incorporate more career related elements into my planning where possible.

Can you reflect on the impact that the project had on your ability to create teaching resources?

Good. I also had to work within a tight budget.

All of the information available meant that making resources took less research than usual. The funding helped a lot because it meant that we could afford to be more creative without the worry of the cost.

The main impact was access to industry resources and ideas that I could incorporate into my teaching and learning.

Creating new teaching resources has generally been an aspect of my role all the time, however creating resources that are able to disseminate directly to others is not. Producing the planning documentation that would allow someone else to deliver is mostly what has impacted on my abilities here.

Have other colleagues benefitted through the dissemination of teaching resources?

Yes – the Head of Department is using the resources to develop specific dedicated one day local fieldwork for future Year 7 pupils.

Yes, my colleagues in our secondary department have benefitted from the dissemination of the teaching resources.

Yes, at my previous school – Hessle High School & 6Th Form College.

Yes, this was included in our key stage 3 scheme of work for all pupils in ICT.

I am aware that other schools within our cluster have looked towards delivering the event or something similar.

Summary of teachers' reflections

Teachers reported that they had found the experience very positive as it gave them the opportunity to network with teachers in other schools, share learning resources and share good practice. Some commented that they were more gender conscious when teaching and ensured that all pupils were expected to take an interest in STEM subjects by creating gender-neutral teaching resources. In addition, one teacher stated that although planning and producing teaching resources is a routine part of their teaching role producing the

planning documentation that would allow someone else to deliver is not and this positively impacted on this teacher's abilities. The links with real life learning and to academic research increased teacher motivation and interest and this was reflected in their teaching resources.

Many teachers commented on the impact that participating in this project had had on their professional development. It enabled them to develop both as teachers and leaders. One teacher reflected that they attributed their current role as Assistant Head teacher to having taken part in the Forewind project as they had learned both leadership and organizational skills. Others reflected that the skills and contacts that they had acquired during the project has enabled them to continue to develop into retirement and they are now working independently with industry.

Final conclusions of Champions for Wind Project

This project ran over three years with 24 schools, 464 pupils and 41 teachers in total taking part. Analysis was carried out to investigate whether knowledge of, and interest in, the offshore wind industry had increased in participating pupils due to the dissemination of teaching materials created by participating schools. In addition, analysis was carried out to investigate whether knowledge in the offshore wind industry and confidence to create teaching materials, and to deliver a programme based on this industry, had increased in participating teachers. Teachers were also asked to reflect on their professional development as a result of taking part in this project

Data used to determine the percentage change in knowledge, interest and confidence were the t-test size of increase reported in cohort 2013 and 2014 (2012 used different questionnaires so this data was not used to establish percentage change).

For pupils there was a significant percentage change in knowledge and interest between cohort 2 (2013) and cohort 3 (2014). See Graphs 1 & 2. In addition, for teachers there was significant percentage change in knowledge and confidence between cohort 2 (2013) and cohort 3 (2014). See graphs 3 & 4.

This has been a very successful project for pupils and teachers. Both pupil's knowledge of, and interest in, the offshore wind industry, Dogger Bank, and career opportunities in this area had increased after their involvement in the Champions for Wind programme. Pupils (both boys and girls) reported a statistically significant desire to learn more about the industry and also to work in the offshore wind industry after being involved in the programme.

In addition, the increase in knowledge and interest reported by the pupils is evidence that during the programme teachers developed their knowledge of the offshore wind industry

and their confidence to create teaching materials aimed at teaching pupils about the offshore wind industry. The professional development of teachers involved in the programme is crucial, as they will be responsible for teaching future cohorts of pupils. Champions for Wind will only be sustainable if teachers develop their confidence, knowledge and teaching materials to share with future Teaching Champions.

The Champions for Wind project has been a very successful project with a minimum of 464 pupils benefitting from 41 schools across the region. It is reasonable to assume from the percentage change data in pupil knowledge and interest that teachers are more confident in creating teaching resources and more knowledgeable about the offshore wind farm industry and in particular Dogger Bank. This is supported by the percentage change data in teacher confidence and knowledge reported between cohort 2 and 3. These percentage increases should increase again over the coming years as the teachers continue to improve their resources and disseminate these resources to additional teachers both in their own schools and schools within their locality.

Appendices

Appendix 1 –
Pre-programme teacher questionnaire

Appendix 2 –
Pre-programme pupil questionnaire

Appendix 3 –
Post-programme teacher questionnaire

Appendix 4 –
Post-programme pupil questionnaire

Appendix 5-
Questionnaire for teachers to reflect on participation in project

Appendix 6 –
Questionnaire for pupils to reflect on participation in project

Appendix 7 -
Pupil consent form and debrief information

“Champions for Wind” Teacher Questionnaire

Pre Programme

As part of the Forewind education programme “Champions for Wind” we are evaluating pupils’ prior knowledge and understanding about the offshore wind industry and career opportunities in this area. Following implementation of the education programme we plan to evaluate how successful this programme has been.

Pupils are being asked to complete a 15 minute questionnaire to measure their prior knowledge and perceptions, please ensure that they work on this alone without assistance. However, help can be given if the pupil has difficulty reading the content of the questionnaire.

In addition, could you please complete the questions below based on your current knowledge and experience:

Name: _____

School: _____

Which subjects within the curriculum do you teach: _____

Number of years teaching: _____

Please answer the following questions:

Q1. On a scale of 1 (nothing) to 5 (a lot), please rate how much you feel you currently know about each of the following areas:

Renewable energy

1 2 3 4 5

Wind farms

1 2 3 4 5

Offshore wind industry

1 2 3 4 5

Forewind / Dogger Bank

1 2 3 4 5

Careers in the offshore wind industry

1 2 3 4 5

Qualifications necessary for careers in the offshore wind industry

1 2 3 4 5

Experience required to gain employment in the offshore wind industry

1 2 3 4 5

Q2. On a scale of 1 (not at all) to 5 (a lot), please rate how confident you would currently feel to create and deliver an education programme to pupils on each of the following areas:

Renewable energy

1 2 3 4 5

Wind farms

1 2 3 4 5

Offshore wind industry

1 2 3 4 5

Careers in the offshore wind industry

1 2 3 4 5

Qualifications necessary for careers in the offshore wind industry

1 2 3 4 5

Experience required to gain employment in the offshore wind industry

1 2 3 4 5

Q3a. Have you been involved in delivering a careers education programme before?

Yes No

Q3b. If yes, do you believe it was successful?

Q3c. What, if anything, could have made it more successful (e.g., additional resources)

Q4a. On a scale on 1 (not at all) to 5 (very much), to what extent do you feel the "Champions for Wind" programme will benefit your pupils?

1 2 3 4 5

Q4b. Do you feel that all pupils will similarly benefit from this programme?

Yes No

Q4c. If no, what type of pupils in particular do you feel might benefit?

Q5. Please state which areas of the curriculum you believe the Forewind education programme will link well with and why:

Q6. Do you have any other comments regarding your involvement in the Forewind education programme?

Q7. What made you apply to become a teacher champion?

Thank you for taking the time to complete these questions

Pupil Questionnaire 1

Name: _____

School: _____

Age: _____ Circle: Boy / Girl

Please answer the questions below and be honest when answering, no one else will see the answers you give.

On a scale of 1 (nothing) to 5 (a lot), rate how much you know about each of these topics:

Q1. I know what renewable energy is:

1 2 3 4 5

Q2. I know how wind farms work:

1 2 3 4 5

Q3. If you work in the **offshore wind industry**, you help to design, build and manage wind farms at **sea**. There are lots of different careers in this area.

On a scale of 1 (nothing) to 5 (a lot), rate how much you know about:

Q3a. The different **careers** in the offshore wind industry:

1 2 3 4 5

Q3b. The **Dogger Bank** offshore wind farm:

1 2 3 4 5

Q3c. The **careers** available at the **Dogger Bank** offshore wind farm:

1 2 3 4 5

Q4. Please indicate how much you know (1 = nothing, 5 = a lot) about **what a company needs to do to:**

a) Gain permission from the authorities to build an offshore wind farm

1 2 3 4 5

b) Construct an offshore wind farm (including putting together the wind turbines, foundations and substations and making the cables)

1 2 3 4 5

c) Ensure the long-term management, operation and maintenance of an offshore wind farm to keep it working efficiently.

1 2 3 4 5

Q5. Please indicate how much you know (1 = nothing, 5 = a lot) of the **career opportunities** available during each of these stages:

a) Gaining permission from the authorities' to build an offshore wind farm

1 2 3 4 5

b) Constructing an offshore wind farm (including putting together the wind turbines, foundations and substations and making the cables)

1 2 3 4 5

c) The long-term management, operation and maintenance of an offshore wind farm to keep it working efficiently.

1 2 3 4 5

Q6. Please write a **list** of **all the careers** you think might be needed to work in the offshore wind industry:

Q7. On a scale of 1 (nothing) to 5 (a lot), rate how much you know about the **qualifications and experience** needed to work in the offshore wind industry:

1 2 3 4 5

Q8. On a scale of 1 (not at all) to 5 (a lot), rate how much you think **you would like to work** in the offshore wind industry:

1 2 3 4 5

The offshore wind industry employs people with different types of abilities and different qualities

Q9. Write five **personal qualities** that you think might be important to work in the offshore wind industry

-
-
-
-
-

On a scale of 1 (not at all) to 5 (a lot), rate how interested you would be to:

Q10. Learn more about wind farms

1 2 3 4 5

Q11. Learn more about the offshore wind industry

1 2 3 4 5

Q12. Learn more about careers in the offshore wind industry

1 2 3 4 5

Q13. Learn more about the Dogger Bank offshore wind farm

1 2 3 4 5

Q14. Learn more about careers at the Dogger Bank offshore wind farm

1 2 3 4 5

Thank you for completing these questions

“Champions for Wind” Teacher Questionnaire

Post Programme

As part of the Forewind education programme “Champions for Wind” we have evaluated pupils’ prior knowledge and understanding about the offshore wind industry and career opportunities in this area. Following implementation of the education programme we now plan to evaluate how successful these programmes have been.

As before, pupils should be asked to complete a 15 minute questionnaire to measure their current knowledge and perceptions, please ensure that they work on this alone without assistance. However, help can be given if the pupil has difficulty reading the content of the questionnaire.

In addition, could you please complete the questions below based on your current knowledge and experience:

Name: _____

Please answer the following questions:

Q1. On a scale of 1 (nothing) to 5 (a lot), please rate how much you feel you currently know about each of the following areas:

Renewable energy

1 2 3 4 5

Wind farms

1 2 3 4 5

Offshore wind industry

1 2 3 4 5

Forewind / Dogger Bank

1 2 3 4 5

Careers in the offshore wind industry

1 2 3 4 5

Qualifications necessary for careers in the offshore wind industry

1 2 3 4 5

Experience required to gain employment in the offshore wind industry

1 2 3 4 5

Q2. On a scale of 1 (not at all) to 5 (a lot), please rate how confident you currently feel to create and deliver an education programme to pupils on each of the following areas:

Renewable energy

1 2 3 4 5

Wind farms

1 2 3 4 5

Offshore wind industry

1 2 3 4 5

Careers in the offshore wind industry

1 2 3 4 5

Qualifications necessary for careers in the offshore wind industry

1 2 3 4 5

Experience required to gain employment in the offshore wind industry

1 2 3 4 5

Q3a. Do you believe the 'Champions for Wind' project in your school was successful?

Please circle: Yes No

Q3b. Please state the reason for your answer to Q3a:

Q3c. What, if anything, could have made it more successful (e.g., additional resources)

Q4a. On a scale on 1 (not at all) to 5 (very much), to what extent do you feel the "Champions for Wind" programme has benefitted your pupils?

1 2 3 4 5

Q4b. Did you feel that all pupils similarly benefited from this programme?

Yes No

Q4c. If no, which type of pupils in particular benefitted?

Q5. Please state which area of the curriculum you included the Forewind education programme within:

Q6a. Could you please provide some detail about how you implemented the "Champions for Wind" project into your classroom.

Q6b. Which aspects of your Champions for Wind project do you feel your pupils were

Most engaged with:

Least engaged with:

Q7. After the programme has ended, do you have any other comments regarding your involvement in the Forewind education programme?

Thank you for taking the time to complete these questions

Pupil Questionnaire 2

Name: _____

School: _____

Age: _____ Circle: Boy / Girl

This questionnaire is very similar to one that you completed earlier this year. However, please complete this again based on your current thoughts and knowledge. Please answer the questions below and be honest when answering, no one else will see the answers you give.

Q1. On a scale of 1 (nothing) to 5 (a lot), rate how much you know about each of these topics:

I know what renewable energy is:

1 2 3 4 5

Q2. I know how wind farms work:

1 2 3 4 5

Q3. If you work in the **offshore wind industry**, you help to design, build and manage wind farms at **sea**. There are lots of different careers in this area.

On a scale of 1 (nothing) to 5 (a lot), rate how much you know about:

Q3a. The different **careers** in the offshore wind industry:

1 2 3 4 5

Q3b. The **Dogger Bank** offshore wind farm:

1 2 3 4 5

Q3c. The **careers** available at the **Dogger Bank** offshore wind farm:

1 2 3 4 5

Q4. Please indicate how much you know (1 = nothing, 5 = a lot) about **what a company needs to do to:**

a) Gain permission from the authorities to build an offshore wind farm

1 2 3 4 5

b) Construct an offshore wind farm (including putting together the wind turbines, foundations and substations and making the cables)

1 2 3 4 5

c) Ensure the long-term management, operation and maintenance of an offshore wind farm to keep it working efficiently

1 2 3 4 5

Q5. Please indicate how much you know (1 = nothing, 5 = a lot) of the **career opportunities** available during each of these stages:

a) Gaining permission from the authorities' to build an offshore wind farm

1 2 3 4 5

b) Constructing an offshore wind farm (including putting together the wind turbines, foundations and substations and making the cables)

1 2 3 4 5

c) The long-term management, operation and maintenance of an offshore wind farm to keep it working efficiently

1 2 3 4 5

Q6. Please write a **list** of **all the careers** you think might be needed to work in the offshore wind industry:

Q7. On a scale of 1 (nothing) to 5 (a lot), rate how much you now know about the **qualifications and experience** needed to work in the offshore wind industry:

1 2 3 4 5

Q8. On a scale of 1 (not at all) to 5 (a lot), rate how much you think **you would like to work** in the offshore wind industry:

1 2 3 4 5

The offshore wind industry employs people with different types of abilities and different qualities

Q9. Write five **personal qualities** that you think might be important to work in the offshore wind industry

-
-
-
-
-

On a scale of 1 (not at all) to 5 (a lot), rate how interested you would be to:

Q10. Learn more about wind farms

1 2 3 4 5

Q11. Learn more about the offshore wind industry

1 2 3 4 5

Q12. Learn more about careers in the offshore wind industry

1 2 3 4 5

Q13. Learn more about the Dogger Bank offshore wind farm

1 2 3 4 5

Q14. Learn more about careers at the Dogger Bank offshore wind farm

1 2 3 4 5

Q15. What part of the offshore wind project have you **enjoyed the most**?

Q16. What part of the offshore wind project have you **enjoyed the least**?

Thank you for completing these questions.

Teacher Interview Questions

This evaluation is simply aimed at trying to identify the impact that the Champions for Wind programme has had on the teachers who were involved. The information that you give me will be made anonymous. This is not an evaluation of you, your pupils, or your school, the questionnaires are simply aimed at identifying the impact the CFW programme has had across the four years.

Questions:

Did you attend the initial conference? If so, can you tell me your thoughts about the initial conference?

What, if anything, do you think you have *learned* from being involved in this project?

What, if anything, do you think you have *gained* from being involved in this project?

Which aspect was the most satisfying?

Which aspect was the least satisfying?

Which aspect was the most challenging?

Can you reflect on the impact that the project had on your professional development?

Can you reflect on the impact that the project had on your teaching ability?

Can you reflect on the impact that the project had on your ability to create teaching resources?

Have other colleagues benefitted through the dissemination of teaching resources?

Pupil Consent Form

Title of project: **Champions for Wind Project.**

Researcher: Dr Myfanwy Bugler, Department of Psychology, University of Hull

This project is going to be delivered by your teacher within the school day and focuses on developing your knowledge of the wind farm industry (particularly the offshore wind industry). You will learn how offshore wind farms can generate electricity for our homes and industries and provide careers for local school leavers.

If you agree to take part in this project you must complete the following questions. Please cross out as necessary:

- Do you understand what the project is about YES/NO
- Have you had the opportunity to ask questions YES/NO
- Have all your questions been answered YES/NO
- Have you been given enough information about the project YES/NO
- Do you understand that you do not have to complete the questionnaire if you don't want to YES/NO
- Do you agree to take part in the study YES/NO

This project has been explained to me and I agree to take part. I know that I don't have to answer the questionnaires if I choose not to.

Signature of Pupil……

Date……..

Name (in block capitals)……..