IOP Institute of Physics

Future Physics Leaders

Project Initiation Documentation (PID)

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Project Manager:	[redacted]		

Revision History

Revision Date	Previous Revision Date	Summary of Changes
21/04/2017	N/A	First draft (author [redacted]), not yet reviewed.
26/04/2017	21/04/2017	Edits from [redacted] and [redacted]
27/04/2017	26/04/2017	Additions from [redacted]
28/04/2017	27/04/2017	Additions from [redacted]
28/04/2017	28/04/2017	Proposal Draft Finalisation
03/08/2017	28/04/2017	Amendments from [redacted]
07/08/2017	03/08/2017	Additional Amendments from [redacted]
18/08/2017	07/08/2017	Amendments from [redacted]
22/08/2018	18/08/2017	Amendments from [redacted]

1. Description and Scope

1.1 Project Summary

The Institute of Physics (IOP), through the Future Physics Leaders (FPL) Programme will provide a programme of professional development and support for specialist physics teachers, Newly Qualified Teachers (NQTs) and non-specialist physics teachers. There will be a focus on supporting deprived schools and areas in England. The FPL programme will be designed on a hub model, where groups of schools will be organised geographically into networks, called Hubs, comprising one Lead School and [redacted] Partner Schools. [redacted] hubs will be established in each of the three TLIF Lots, for a total participation of [redacted] schools; [redacted] Lead Schools and [redacted] Partner Schools. Hub schools will be connected through a Development Coach who will implement project activities and train advanced teachers to become future School-Based Development Coaches (SBDCs).

1.2 Background

Physics is a subject with the potential to contribute positively to upward social mobility for those that choose to study it. According to 2015 HESA data, the average physics graduate salary was more than 13% higher than the overall average graduate salary[1] and, with 43% of STEM vacancies identified as hard to fill due to a shortage of required skills, a physics education is likely to lead to good career outcomes for pupils.[2] Therefore, a high-quality physics education, taught by a qualified physics teacher, should be a component of any wellrounded school offering.

At present, however, this is not the case. In 2015/16 a National Audit Office report found that 29% of postgraduate teacher training places in physics were unfilled compared to 6% unfilled for all subjects.[3] Within physics classrooms themselves, there were additional complications, with the number of classes taught by a teacher without a post A-level physics qualification at nearly 30%.[4] Teacher quality is a major factor for determining pupil outcomes. It is often in disadvantaged areas and schools, in which students could benefit most, where students are least likely to receive instruction from an appropriately trained teacher.

1.3 Purpose

The purpose of the FPL programme is to improve student outcomes in physics and to sustain this improvement by increasing leadership capability and capacity within the target areas. This will be accomplished through a programme of development for future physics coaches, future Lead Teachers, NQTs and non-specialist teachers of physics, as well as through improving teacher pedagogical and subject knowledge and recruitment and retention in target schools.[5]

1.4 Objectives and Key Performance Indicators

[1] HESA data 2015

[2] "New Report Shows STEM Workers Twice As Likely To Miss Job Opportunities Due To Lack Of Skills - GOV.UK". Gov.uk. N.p., 2017. Web. 27 Apr. 2017.

[3] Morse, Amyas. Training new teachers. London: National Audit Office, 2016. Print.

[4] Morse, Amyas. Training new teachers. London: National Audit Office, 2016. Print. [5]

Social inequalities in access to teachers, Allen, Mian and Sims (2015) SMF

To meet the overall purpose of this programme, the IOP will meet the following objectives:

Objective 1: Improve quality of teachers and effective teaching in classrooms.				
KPI	Description	Measured by	Target	Target deadline
1.1	Teachers report likely positive impact on classroom practice	Feedback surveys administered by the Development Coach	80% of teachers report likely positive impact	31 March 2018 31 March 2019 31 March 2020
1.2	Recruit specialised physics NQTs throughout the lifetime of the programme	Contact through IOP networks (year 2 and 3 only)	Year 2: 12 Year 3: 12 (24 in total)	31 March 2019 31 March 2020
Objective 2: Improved Progression of Teachers and Leaders				
KPI	Description	Measured by	Target	Target deadline
2.1	Lead Teachers trained as SBDCs	Project reports from Development Coaches	Year 2: 12 Year 3: 24 (24 in total)	31 March 2019 31 March 2020
2.2	Teachers indicate an increase in confidence to seek out leadership roles	Surveys, or other appropriate methods, administered by the project evaluators	80% of teachers report increased confidence	31 March 2018 31 March 2019 31 March 2020
2.3	NQTs in participating schools indicate an increase in likelihood of seeking additional responsibility in the next three years	Surveys, or other appropriate methods, administered by the project evaluators	85% of NQTs report an increased likelihood	31 March 2018 31 March 2019 31 March 2020
Objective 3: Improved Retention of Leaders				
KPI	Description	Measured by	Target	Target deadline
3.1	The overall rate of churn for all teachers participating in the programme to parallel jobs is reduced	Surveys, or other appropriate methods, administered by the project evaluators	Churn decreased by 5%	31 March 2018 31 March 2019 31 March 2020
3.2	The overall rate of churn for specialist physics teachers participating in the programme to parallel jobs is reduced	Surveys, or other appropriate methods, administered by the project evaluators	Churn decreased by 10%	31 March 2018 31 March 2019 31 March 2020
Objective 4: High Quality NQTs are more likely to stay in the profession and region				
KPI	Description	Measured by	Target	Target deadline

4.1	Improve the overall retention of NQTs in teaching	Surveys, or other appropriate methods, administered by the project evaluators, to determine wastage rate of all NQTs in participating schools	Reduce overall wastage rate by 10%	31 March 2018 31 March 2019 31 March 2020

4.2	Improve retention of NQTs in participating schools	Surveys, or other appropriate methods, administered by the project evaluators, to determine attrition rate of NQTs changing schools within the first two years	Reduce overall attrition rate by 10%	31 March 2018 31 March 2019 31 March 2020
Objective 5: A Better, Tailored, Local and Sustainable CPD offer is available for Teachers and Leaders in Challenging Schools and Areas				
KPI	Description	Measured by	Target	Target deadline
5.1	Teachers in priority schools are receiving high levels of CPD support	Project reports on teacher hours of support through CPD	Annual Teacher CPD Hours [redacted]	31 March 2018 31 March 2019 31 March 2020
5.2	Teachers in priority areas are receiving high levels of CPD support	Project reports on teacher hours of support through CPD	Annual Teacher CPD Hours [redacted]	31 March 2018 31 March 2019 31 March 2020
Outcome 6 (Impact 1): Improved Pupil Outcomes				
KPI	Description	Measured by	Target	Target deadline
6.1	Increase in pupils achieving a good pass in physics in participating schools	Analysis of DfE Performance Tables, Key Stage 4 qualification and subject level results	5 percentage point increase in pupils achieving a good pass after 3 years	31 March 2020
6.2	Increase in progression of pupils to A-level physics in participating schools	Aggregation of pupil-level KS5 attainment data from the National Pupil Database	15% increase in pupils progressing after 3 years	31 March 2020

In addition to the KPIs described above, the IOP will meet the following service level KPIs, as set out in the Schedule 4 of the project contract. The highlighted KPIs have financial consequences if unmet:

KPI	Measure	Monitoring Method	Service Credit Mechanism (SCM)	Target and Measure for application of SCM

1	Recruitment A minimum of [redacted] schools to be recruited	Monthly monitoring during the recruitment cycle.	SCM 1a Recruitment in cohort 1	100% of cohort of 65 schools to be recruited by 31 March 2018
	during the programme ([redacted] partner schools and [redacted] lead schools). [redacted] schools to be recruited in year 1 [redacted] schools to be recruited in year 2.	Success against target will be measured for each cohort at the start of the first year of the programme.	SCM 1b Recruitment in in cohort 2	100% of cohort of 103 schools to be recruited by 31 March 2019
2	Recruitment A minimum of [redacted] participants to be recruited during the programme, assuming an average of [redacted] participants per school. [redacted] to be recruited in year 1 [redacted] to be recruited in year 2	Monthly monitoring during the recruitment cycle. Success against target will be measured for each cohort at the start of the first year of the programme.		Cohort 1 of [redacted] participants ([redacted] schools) recruited by 31 March 2018, but not in relation to service credits. Cohort 2 of [redacted] participants ([redacted] schools) recruited by 31 March 2019, but not in relation to service credits.

3	Geographical spread of participants 100% of the schools to come from priority areas. A minimum of 70% of participants to come from priority schools.	Success against target will be measured for each cohort at the start of the each year of the programme	SCM 3a geographical participant target cohort 1 SCM 3b geographical participant target cohort 2	Targets as specified on 31 March 2018 Targets as specified on 31 March 2019
4	Retention Recruit the best candidates and engage them throughout so that 95% of schools complete the programme	Retention rates will be measured for each cohort from the start of the programme each year through to the end of each year of the programme	SCM 4a - 95% of schools complete Year 1 of the programme SCM 4b - 95% of schools that are enrolled on the programme on 1	Targets as specified on 31 March 2018 Targets as specified on 31 March 2019
		The retention KPI will measure withdrawals for reasons within the Contractor's control (e.g. those leaving due to issues with programme quality or appropriateness of the programme to their needs).	April 2018 complete Year 2 of the programme SCM 4c - 95% of schools that are enrolled on the programme on 1 April 2019 complete Year 3 of the programme	Targets as specified on 31 March 2020

5	Satisfaction 80% of participants rate the programme as good or above overall.	Satisfaction will be measured through a survey completed by all participants at the end of each year of the programme.	SCM 5a - Satisfaction - 80% of participants* rate the programme as good or above SCM 5b - Satisfaction - 80% of participants rate the programme as good or above SCM 5c - Satisfaction - 80% of participants rate the programme as good or above *Only those participants that have been enrolled in the programme for at least one halfterm will be included.	Targets as specified on 31 March 2018 Targets as specified on 31 March 2019 Targets as specified on 31 March 2020

1.5 Project Scope

1.5.1 Inclusions

- Marketing to and recruitment of target schools to the FPL programme
- CPD support for non-specialist teachers of physics in all participating schools and Hubs
- Professional Development Training to Specialist Physics teachers
- A coherent development programme for Lead Teachers to become SBDCs

- Regional Days for specialist physics teachers in all hub schools
- Recruitment support to Hub and local schools for the recruitment of Physics NQTs
- Mentoring support to NQTs
- Coordination with school Senior Leadership Teams (SLTs) to ensure the most effective implementation of programme activities, including NQT workloads
- Organisational support for peer-to-peer networking events
- Completion of feedback surveys to monitor programme implementation
- Tracking and maintenance of comprehensive data on participant engagement

1.5.2 Exclusions

- Development of additional resources to support CPD
- Evaluation of programme activities, be completed by a DfE contracted external evaluator
- Capital or other support required for CPD provision

1.5.3 Deliverables

- Recruitment of [redacted] schools; [redacted] Partner Schools and [redacted] Lead Schools
- Provision of [redacted] hours of CPD support to teachers in priority areas ([redacted] teacher hours for non-specialist teachers and [redacted] Teacher hours for specialist teachers)
- Within the above, provide [redacted] hours of CPD support to teachers in priority schools
- Training of 24 Lead Teachers as SBDCs
- Mentoring support for area NQTs
- Recruitment of 24 NQTs to Partner Schools or other local schools
- Implementation of nine Regional Day Meetings

1.5.4 Constraints

- Limited time available for recruitment and on-boarding
- Limited number of schools available in localities within sufficient distance to start a Hub
- Teacher availability to take part in CPD sessions and training exercises
- Limited number of new roles coming available for NQTs

1.5.5 Assumptions

- School improvement relies on high quality teachers and leaders within the subject
- NQTs will be attracted to a job with a sympathetic timetable and mentoring
- NQTs are more likely to stay in the school profession if developing a subject specialism
- Improving professional identity and community building, via CPD, will improve retention
- Providing opportunities for increased responsibility will improve teacher retention
- CPD activities will yield the desired benefits to students and teachers
- A sufficient number of positions for NQTs will become available during the project
- Schools SLTs will permit specialist physics teachers to be bought out for half-days
- Suitable spaces will be available at Lead Schools to host CPD events
- Lead Teachers will be willing to provide mentoring support and train to be SBDCs

2. Business Case Fulfilment

2.1 Systems and Processes

- Progress reporting to HQ via an online reporting system
- Stakeholder management through the IOP's Salesforce system

- Regular review of field staff teacher support hours to ensure implementation
- Analysis of School Workforce Census and National Pupil Database to monitor impact
- Regular feedback from CPD events after individual sessions and on an annual basis
- Appropriate IT systems, including knowledge management platforms

2.2 Costs and Timescale

In the below costs, value for money is achieved through an increase in efficiency of field staff over the project, which decreases staff time and costs in real terms over the life of the project. Value for money is also achieved through the use of existing IOP IP, which removes the need for development costs for resources, including additional staff time.

Phase	Description	Cost Exc VAT
1: Programme Design	Staff Costs for programme design only	
1: Marketing	Marketing Costs including flyer and video production as well as Open Evenings	
2: Programme Delivery	Estimated IOP Staff costs	
2: Programme Delivery	Programme Activity Costs	
3: Programme Closure	Staff Redundancy	
Other	Overheads	
	Total Project Costs	

Future Physics Leaders Programme Timeline												
		04/2017 – 03/2018				04/2018 – 03/2019				04/2019 – 03/2020			
	Activity	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Phase 1	Programme Design												
	Staff Recruitment												
	School/Teacher Recruitment												
	SLT Engagement												
Phase 2	Non-Specialist CPD												
	Specialist CPD												
	Train the Trainer												

	Mentoring Support												
	Regional Day Meetings												
	NQT Recruitment Activities												
Phase 3	Transition to School-led Model												
	Programme Close												

2.3 Costs Benefit Analysis

The following cost-benefit analysis compares project benefits against project cross over weighted impact scores from 1-5, with 5 being high and 1 being low. Benefits are scored based on the number of outcomes to which they contribute and costs are scored based on a [redacted] scale, with [redacted] receiving a score of [redacted] receiving a 5. The analysis shows that the project benefits outweigh costs by more than [redacted]

Cost Benefit Analysis					
Activity	Benefit listed by Outcome #	Benefit Impact 1-5	Cost	Cost Impact 1-5	Ratio
[redacted] Non-specialist teacher hours	1 and 5	2	[redacted]	2	1
[redacted] Specialist teacher hours	1, 2,3,4,5	5	[redacted]	5	1
36 NQTs receiving Mentoring	3 and 4	2	[redacted]	1	0.5
24 NQTs recruited to target schools	2, 3 and 4	3	[redacted]	1	0.33
Lead Teacher Training	1,2,3,4 and 5	5	[redacted]	2	0.4
School Recruitment	1,2,3,4 and 5	5	[redacted]	3	0.6
			Project Cost Benefit Ratio		[redacted]

2.4 Risk Management

Programme risks have been identified in Attachment Submission D and all risks will be collated into a risk register and submitted to the IOP's Programme Board to be monitored and reported on monthly.

2.5 Quality Management

To the greatest extent possible, the project will be managed in accordance with best practice methodology and quality review as is recommended by the IOP's Programme Office. Quality will be measured by project staff through a series of feedback surveys administered throughout the life of the project, and quality assurance will be provided by the IOP's Programme Board.

3. Project Management

3.1 Project Organisation Chart

The diagram below outlines the programme management team structure and key personnel. Additional staff may be co-opted onto the programme team as required.

[redacted]

3.2 Project Sponsor

The Project sponsor will be the DfE and the Project Owner and Project Manager, outlined below, will be responsible for reporting directly to the DfE on progress.

3.3 Project Management

3.3.1 Project Owner

The Project Owner will be [redacted], Head of Education. He will have overall responsibility for the programme and will have general oversight of all relevant activities.

3.3.2 Project Manager

The Project Manager will manage the programme team, outlined in the next section. The Project Manager will be responsible for the quality and delivery of the programme; setting targets, arranging meetings, implementing the delivery plan and maintaining contact with all project stakeholders. The Project Manager will be responsible for the preparation of reports for the DfE as well as for the Advisory Group and IOP Education Committee.

3.4 Project Team

The Project Team will consist of the following roles:

3.4.1 Project Coordinators (1 x 1 FTE, 1 x 0.5 FTE)

There will be two Project Coordinators providing administrative and coordination support across the project, for both Headquarter-based staff and field staff. The Coordinators will also play a significant role in recruiting schools to the programme.

3.4.2 Project Manager, Girls in Physics (1 x 0.2 FTE)

An existing Project Manager, [redacted], will provide support to the programme throughout the life of the project to ensure that the programme offering is inclusive for all prospective physics students.

3.4.3 Business Development Manager (1 x 0.2 FTE)

An existing Business Development Manager, Kristina Dennison, will provide support for the implementation of the project through the completion of financial analysis and reporting, the review and preparation of contracts, and the development of programme reports.

3.4.4 Team Leaders (3 x 0.2 FTE)

This Programme will recruit three Team Leaders tasked with overseeing the implementation of programme activities by field staff in network schools. Each Team Leader will be responsible for monitoring the work conducted in a specific Lot.

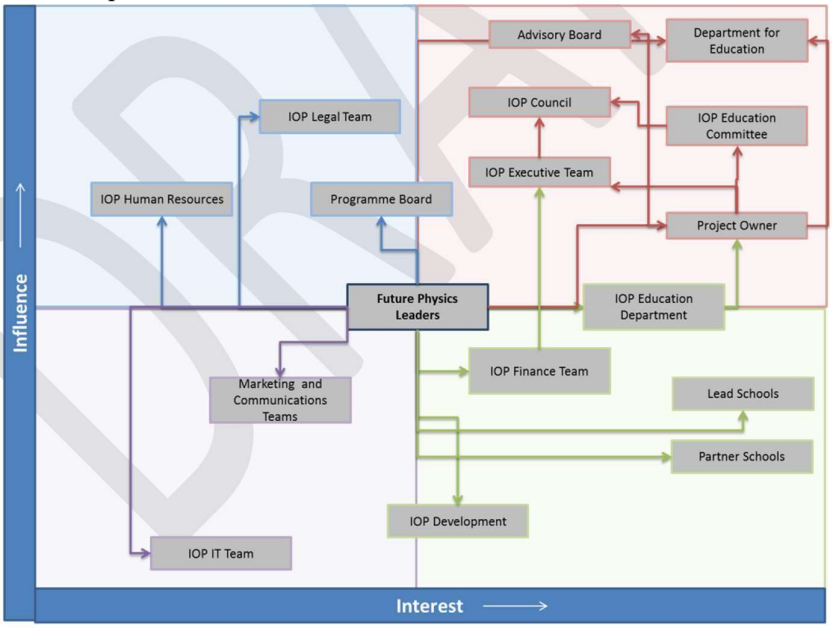
3.4.5 Development Coaches (12 x 0.6 FTE)

Development Coaches will be recruited to work directly with teachers in all Partner and Lead Schools to provide CPD, mentoring and training support, organise networking events and deliver Regional Day Events. Development Coaches will also work directly with school SLTs to ensure that programmatic activities can have the greatest impact.

3.5 Governance

The IOP's implementation of the FPL programme will be monitored internally by the IOP's Education Committee, which oversees the governance of all externally funded education projects. The Education Committee will report to IOP Council on the programmes implementation. The programme will also be guided during four annual meetings by an Advisory Group comprising of a range of stakeholders, both internal and external, from throughout education, the sciences and engineering. The members of this Advisory Group are still to be confirmed.

3.6 Stakeholder Map



4. Project Delivery

Overall project delivery timeframes will be in accordance with the Project Plan submitted as Attachment C of the TLIF Bid.

4.1 Human Resource Project Team Requirements

4.1.1 Support Staff

Additional Support Staff			
Phase	Role	Task	Level of Support
1	Head of Human Resources	Recruitment of project staff	7 months at 0.15
1	Programme Manager, IOP Programme Office	Interim programme management	4 months at 0.75
1	Field Workers	Support school recruitment	6 months at 0.375
1	Higher Education Liaison Officer	Support school recruitment	6 months at 0.28
1	Development Writer	Support programme design	10 days at 1
1	Teacher Support Manager	Support programme design	10 days at 1
1	Group Legal Adviser	Contract negotiation	2 months at .05
1	Marketing Executive	School recruitment	15 months at .05

1	Regional Officers	Schools recruitment	10 months at 0.1
1	Marketing Manager	School recruitment	15 months at .05
1-3	Head of Communications	School communications	Project at .05
1-3	Institute Business Partner	Lead financial management	Project at .1
1-3	IT Operational Manager	Provide IT support	Project at .05

4.1.2 Additional Staff

No staff not listed as part of the Project Team or as Project Support Staff will be required.

4.2 Project Controls

This Project Initiation Document along with the documentation submitted as part of the TLIF Bid will serve as a baseline for the implementation of the Future Physics Leaders Programme. Changes to the programme can be requested and will require approval from the Programme Board as well as from the Department for Education.

4.3 Monitoring Mechanisms

In order to ensure the successful implementation of the project, the IOP will:

- Regularly monitor pupil attainment and progression in participating schools through the National Pupil Database
- Oversee data analysis to monitor progress against KPIs, as required
- Complete feedback surveys for CPD events
- Monitor and record the number of teacher support hours completed by all programme staff
- Work with the project evaluators to facilitate access to participants

4.4 Communication Channels

Communications activities will be completed in accordance with the plan set out in the bid document Creating Demand and Securing Participants. To ensure the success or these activities, communications channels will be established with a number of organisations including:

- Target Schools, including SLTs and Physics Teachers, for recruitment
- Local businesses, to leverage for programme marketing
- Lead Teachers, to promote programme activities within Hubs
- Journalists, to leverage for programme marketing and teacher retention
- Newly Qualified Teachers, for recruitment to participating schools