

SYSTEMIC

SAY YES TO STEM IN THE CLASSROOM



TEACHER PLACEMENT INITIATIVES

Collection of best practices

September 2017





European Schoolnet (www.europeanschoolnet.org) is a network of 31 Ministries of Education from across the European member states, leading educational innovation at European level. As a major international think tank, European Schoolnet operates key European services in education on behalf of the European Commission, member Ministries of Education and industry partners.

European Schoolnet's activities are divided among three areas of work:

- **Policy, research and innovation:** information sharing and evidence building.
- **Schools services:** enhancing cooperation between schools across Europe.
- **Advocacy:** how ICT and digital media contribute to transforming teaching and learning processes.

Publisher: European Schoolnet
(EUN Partnership AISBL)
Rue de Trèves, 61
1040 Brussels, Belgium

Authors: Yves Beernaert and Magda Kirsch (Educonsult),
Marina Jiménez Iglesias and
Maïté Debry (European
Schoolnet)

Please cite this publication as:

European Schoolnet (2017) Teacher placement initiatives - Collection of best practices, Brussels, Belgium.

Keywords: Science, Technology,
Engineering and Mathematics
Education (STEM Education);
Information and
Communication Technologies
(ICT); Industry

Design/DTP: Jessica Massini

Picture credit: Eerst De Klas, Tostaky agency,
die bayerische wirtschaft, STEM
Insight, NAOISE CULHANE,
TechniekTalent.Nu, TuWaSI -
Köln/Bonn

Sensay, Roman Kosolapov,
Rawpixel.com/Shutterstock

Published in September 2017. The views expressed in this publication are those of the author and not necessarily those of EUN Partnership AISBL (European Schoolnet) or the STEM Alliance partners.



This report is published under the terms and conditions of the Attribution-Noncommercial 3.0 Unported (<http://creativecommons.org/licenses/by-nc/3.0/>).



TABLE OF CONTENT

Foreword..... 2

Introduction..... 3

Eerst de Klas [Netherlands]..... 5

Entr'apprendre – Continuous Education / Placement Programme for Teachers in Companies [Belgium]..... 9

Google / Teach First Internship Programme [UK]..... 13

Kenan Fellows Program [North Carolina, USA]..... 15

Lehrer in der Wirtschaft [Germany] 19

Professeurs en entreprise [France] 23

STAR STEM Teacher and Researcher Program 2017 [USA] 25

STEM Insight [UK] 29

STEM Teacher Internship Programme DCU and Accenture [Ireland] 33

Teacher Placement in Industry with Entrepreneurship Education for Pupils [Belgium]..... 37

Teacher Placement Initiative IgnitEd Summer Fellowships Program [USA] 41

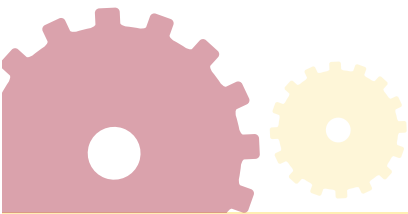
Teacher Placements in Industry [Australia] 47

Teachers in Industry [Arizona USA] 51

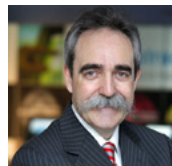
TuWaS! [Germany] 55

VETtLIS [Montenegro] 59

Conclusions and Recommendations 63



FOREWORD



In Europe and around the world we are in a period of rapid transformation of industries, as technology plays an increasing role in all aspects of product and services design and delivery, and every industry becomes digital. This change is generating a need for new skills: technical skills and IT skills, combined with skills in project management, communications and team working. There is a common requirement for strong STEM skills.

These developments are very exciting, with significant opportunities for new growth and innovation. At the same time there are challenges to align skills with employer needs, and to keep pace with change. We hear frequent calls from business, governments and education institutions for a much stronger connection between education and the labour market to address this. There are several initiatives to enhance student learning and exposure to real work settings, and these should be supported and expanded. At the same time, Teachers are critical to enabling students to gain higher qualifications and broaden their skills. They, too, need exposure to first-hand experience of the new skills and jobs that are evolving, and to contemporary work practices in industry.

This publication from the STEM Alliance and SYSTEMIC is timely and very welcome. It contains a diversity of Teacher Placement schemes which can be adapted to different contexts. We need to bring this practice into the mainstream, and engage full collaboration from industry and government. By doing that we will enhance Europe's potential to innovate and to grow.

A handwritten signature in black ink, appearing to read 'J. Zufiria', written on a light-colored background.

Juan Antonio Zufiria – General Manager IBM Europe



INTRODUCTION

STEM teacher placements in industry are work placements or internships that provide opportunities for STEM teachers to upgrade their knowledge, skills and competences in science, technology, engineering and maths, as well as to improve their teaching of STEM subjects.

Placements offer a way to link the professional and academic worlds, improving teaching and student learning. With them, educators are able to obtain work experience in companies and get first-hand examples of how STEM disciplines are essential for industry and business development. Placements also enhance the quality of career counselling in schools (by facilitating educators' contextualisation of STEM teaching) and strengthen the development of STEM-oriented school strategies.

In order to promote STEM teacher placements in industry, the STEM Alliance has developed the **Teacher Discovery Placement** scheme, an initiative of the STEM Alliance¹ in collaboration with the SYSTEMIC project.² The general purpose of the programme is to provide a framework and an ecosystem for (1) Ministries of Education, to engage teachers in such placements, and (2) companies welcoming teachers involved in work placements on their premises. The ultimate and most important objective of the scheme is to highlight existing programmes and to set up and run a common analysis framework that will help ensure the success, promotion and development of these placements.

Within this scheme, the STEM Alliance has **produced this booklet of best practices in STEM teacher placements in industry**. This publication aims to assemble a significant number of relevant practices of current teacher placements, in order to highlight the

1 The STEM Alliance – www.stemalliance.eu – is an industry-education cooperation initiative coordinated by European Schoolnet and CSR Europe which aims to promote Science, Technology, Engineering and Maths education and careers to young Europeans and address anticipated future skills gaps within the European Union.

2 SYSTEMIC is a strategic partnership project funded under KA2 of the Erasmus+ programme.

diversity of existing ones. Its main objective is to understand how these companies are developing teacher placement initiatives as well as to disseminate teacher/company collaborations.

The description used to develop the collection of best practices included in this booklet follows a specific typology that takes into account (1) all the elements related to the scope and structure of teacher placement programmes and (2) pedagogy and teacher professional development. Finally, this collection has been enriched through the development of a survey collecting teacher placement activities from (or relevant to) the STEM Alliance partners.

SYSTEMIC is funded by the Erasmus+ Programme of the European Union. This publication constitutes the first part of the Intellectual Output 4 'Guide on contextualisation of STEM teaching' of the SYSTEMIC project. In this guide we provide comprehensive information in the form of use cases describing programmes linking STEM teaching with real-life industry situation. The description of the teacher placements (TP) programme presented in this publication aims to inspire the industry world and public authorities to establish more cooperation of this type between schools and companies. The second part of the SYSTEMIC Intellectual Output 4 will include guidelines and conditions of success for this type of school/industry collaboration and some analysis on how the Teacher Placements contribute to improve teacher's STEM skills and their capacity to influence students' studies and careers choice.





EERST DE KLAS [NETHERLANDS]

The initiative

Eerst de Klas (First in the classroom) is a two-year traineeship provided for excellent young academics with an interest in education and business. As part of this programme, outstanding students spend some time teaching after graduation before pursuing a career in business.

As part of the Eerst de Klas project, talented university graduates work several days a week as secondary school teachers for a two-year period. In addition to earning a teaching qualification, they take part in an intensive business leadership programme. During the pilot, participants will earn a supplementary qualification to teach all years and all types of secondary education (eerstegraads onderwijsbevoegdheid).

The two-year programme is composed of an introduction period, a first year of preparing for the teacher qualification while teaching three days a week, and a second year teaching four days a week. During these two years, every Friday, the trainees are involved in a leadership programme organised by a company. The leadership programme involves carrying out an assignment, which is beneficial both to the business/organisation and to the intern.

This initiative is part of the overall strategy Teacher 2020 of the Dutch Ministry of Education, to improve teacher education on the one hand and STEM education on the other. It is built on the active involvement of all key stakeholders: business and other organisations, schools, university teacher education institutions and educational authorities, and the VO-Raad or Secondary Education Council.



How does it work?

The initiative's introduction period starts in August and consists of workshops, training sessions, school visits, lectures and other preparatory activities related to work in education. The goal is to prepare the interns as well as possible for the teaching job as well as to get acquainted with other fellow trainees.

During the first year of pre-service teacher education, the interns spend one day a week on teacher training, which is completed by obtaining a qualification to teach at all levels of secondary education in the Netherlands. During the first year, the interns also have a three-day-a-week job as a teacher in a high school in the Netherlands.

During the second year, after they have completed their teaching qualification, they work in the school for four days a week. The work content is defined in agreement with the school and it can consist of providing lessons, guiding specific (STEM) projects, developing innovative materials or tools, innovative school development approaches, etc.

The leadership programme is organised every Friday of the two-year period by leading businesses or organisations in the Netherlands and is designed around the theme of sustainability. Specifically, the programme consists of an orientation module, master classes with key organisations in this field, training in the field of personal development, the development of a project and a joint final assignment. The main goal is for the interns to become familiar with business and develop personal leadership. The project and the final assessment should be agreed upon in advance with the company so that the outcomes or products are useful to both the company and the intern.

Benefits for teachers

During the first-year course, the graduate students involved obtain their teaching qualification as a teacher in every kind of secondary school. They also get the opportunity to become a practising teacher by teaching three to four days a week in a specific classroom. In this way, they acquire various (pedagogical, didactical, social, cultural) competences, skills and extended knowledge on the subjects they teach. They also obtain organisational skills focusing on collaborative work with teachers and with the other interns involved in the programme. The interns also learn to be STEM mediators by conveying to the youngsters they teach the importance of STEM studies and STEM careers.

Through the leadership programme, the project and the assignment, interns acquire various management, communication, presentation and team-building skills and competences that will be useful in their later career. Last, working on the theme of sustainability will enhance their critical and ethical skills and will make them acquainted with responsible research and innovation.

Supporting structures

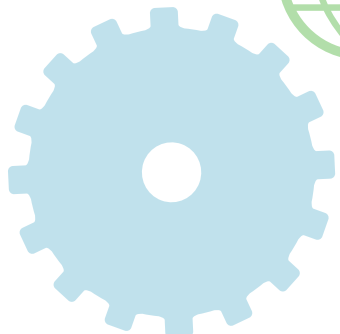
The implementation of the Eerst de Klas initiative requires the structured involvement of various partners: schools, companies/organisations, university teacher education institutions (ULO's) and the Secondary Education Council (VO-Raad).

- Currently, there are more than 200 secondary schools (at VO or upper secondary school level) involved in the project across the Netherlands.
- From the first year, companies or organisations involved in the leadership programme make trainees familiar with the business community. They organise one-day-a-week master classes (first year) and projects with assignments (second year). The following organisations shape the leadership programme: ABN AMRO, Ahold, Akzo Nobel, AMC, Aon, Attero, Brezan, Connexxion, DSM, Rotterdam City Council, Municipality of Haarlemmermeer, Greenpeace, ING, KPN, NIVOZ, NS, Philips, Rabobank, Randstad, Ministry of Education, Culture and Science, RET, Schiphol Group, SER, Shell, Siemens, Stork Technical Services, Tata Steel, TNO and UWV. In addition, trainees receive training offered in the area of personal leadership and development at De Baak.
- Teacher education institutions are also involved. Particularly, arrangements have been made with University Teacher Education Institutes (ULO's) at national level to take on the responsibility for the contents of the teacher education strand and to customise the programmes for participants in the Eerst de Klas initiative. Furthermore, the ULO's have agreed that the heads of three major ULO's will jointly decide on which candidates are selected within the initiative. When a candidate is accepted, he or she is linked to one of the following ULO's: Centre for Teaching and Learning (Utrecht University), ICLON (Leiden University), ILO (University of Amsterdam), Radboud Teachers College (Radboud University Nijmegen), ESoE (Eindhoven University of Technology), ELAN (technical University of Twente), VU University Amsterdam, Delft University of Technology or the University of Groningen.

The programme was launched as a pilot in 2009. With a very positive evaluation, a steady growth in participants and wide appreciation by partners, it has entered a new phase. Since 2012 it has been considered an initiative which contributes greatly to enhancing innovative and socially relevant education for all. It is consistent with the objectives of the policy agenda Teacher 2020 of the Ministry, together with the Action Plan Better for Performing Education, and integrated in a governance agreement of the Ministry. The Ministry of Education has now transferred control of the initiative to the Secondary Education Council. This council takes the lead in promoting it with all schools and has thus strengthened the position of the initiative.

Useful information

- Eerst de Klas
<http://www.eerstdeklas.nl/>
- Main contact person
info@eerstdeklas.nl





ENTR'APPRENDRE – CONTINUOUS EDUCATION / PLACEMENT PROGRAMME FOR TEACHERS IN COMPANIES [BELGIUM]

The initiative

[Entr'apprendre](#), launched in 2015, is an initiative by the Foundation for Education ([Fondation pour l'Enseignement](#)) set up by the French community of Belgium. The aim is to upgrade Vocational Education Training (VET), to support positive orientation by developing entrepreneurship skills and information on work opportunities and jobs of the future, and to stimulate the Corporate Social Responsibility of companies by encouraging skills transfer between businesses and school. In this context, the Foundation actively promotes placements in industry for teachers.

The Foundation's mission is to improve the quality of education through innovative projects (involving all relevant stakeholders), to produce surveys and to make concrete proposals arising from a dialogue between federations of schools and businesses. The Foundation also promotes students' integration into working life. It creates bridges between schools and companies, promoting teachers' confidence and building cooperation.

The ultimate objective of Entr'apprendre is to set up internship programmes for teachers/trainers in companies. The placements consist of short-term internships for teachers (two to four days) based on different businesses. The main aims are:

- to update technical skills linked to different occupations/trades;
- to raise awareness of the operational realities of companies: quality, safety, environment, etc.;
- to improve social attitudes and behaviours, focusing on teamwork and on

enhancing an entrepreneurial mind-set promoting autonomy, initiative and responsibility.

Teachers of practical and general courses (maths, foreign languages, etc.) from technical/ vocational schools, trainers in CEFA centres (Centres d'Éducation et de Formation en alternance - Alternative education and training centres) and CTAs (Centres de Technologies Avancées - Advanced Technology Centres), pedagogical advisors (providing support and advice to teachers) and trainers in institutes of continuing education are eligible to take part in the internship programme.

From 2017 onwards, the initiative will be extended to more sectors, professions and teachers of general courses. Efforts will be made to strengthen links between schools and companies through a dedicated extranet to sustain the relationship created during internships and via an introduction to eLearning. As from 2018, the initiative will be extended to primary school and lower secondary school teachers through an adapted programme. This will be continuously revised on the basis of feedback from teachers and companies.

How does it work?

The Entr'apprendre internship programme is developed in five phases:

- **Phase 1:** The teacher prepares the placement in consultation with other teachers and trainers from the Institute of Continuing Education for Teachers.
- **Phase 2:** The actual internship takes place, including a full two to four days' immersion during which the teachers are actively integrated into the company activities.
- **Phase 3:** Each school network (public, private...) encourages the transfer of experiences gained in schools with the aim of enriching, updating and adapting the skills taught to young people.
- **Phase 4:** Companies and teachers are invited to give feedback on their experience, with the assistance of trainers.

Benefits for teachers

According to the feedback received through the evaluation questionnaires completed by the teachers, trainers and pedagogical advisers involved in the project, the Entr'apprendre internships have helped them in many areas. Specifically, to update vocational and technical skills linked to different occupations and to raise awareness of the operational realities of companies (with a particular focus on quality, safety and environmental issues).

The Entr'apprendre internships also have a positive impact on cooperation between

schools and industry in general. They definitely have an impact in improving teamwork, collaborative work and delegating and sharing of responsibilities, among other skills. Moreover, they directly enhance the entrepreneurial mind-set of teachers, trainers and pedagogical advisors focusing on autonomy, initiative and creativity.

These internship programmes also benefit the businesses by creating confidence between partners. The work of people from companies is better recognised and valued by the trainees.

Supporting structures

The internships organised within the framework of Entr'apprendre are part of the overall strategy of the government of the French-speaking community of Belgium to enhance the quality of education and to better prepare students for employment and higher education.

It is also intended to bring about an enhanced appreciation of the teaching profession, better continuous training for teachers and regular exchanges of best practices, leading to better quality education. It is also expected to create a gradual integration between initial and continuous teacher education.

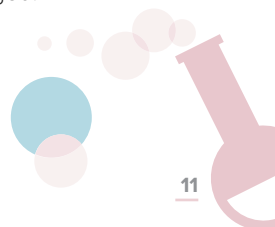
The internships are integrated within the continuous education programmes of continuing educational institutions and are co-constructed and coordinated by a mixed working group. This group includes the institutes for continuing education, the inspectorate of education, sectoral/inter-sectoral federations, professional training funds and companies and agencies fostering entrepreneurship. The coordination of internships is implemented through the Institute of Continuing Education for Teachers (IFC).

Participation in these internships is based on voluntary and mutual commitment through an agreement (trainee's handbook, list of risks, non-disclosure agreement, etc.) between the head of the school, the teachers, the company and the IFC.

The Internships take into account the existing quotas for continuing education of three compulsory and five voluntary days per year. All stakeholders involved in mobilising teachers stimulate frequent communication during the internships.

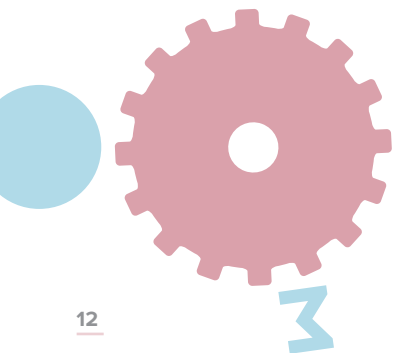
How is the programme evaluated?

The teachers, trainers and pedagogical advisors involved in the internships are invited to complete an evaluation questionnaire. A feedback session is also arranged.



Useful information

- Offre de formations Entr'apprendre
<http://www.ifc.cfwb.be/documents/multi/JDFentrapprendre.pdf>
- Fondation pour l'Enseignement
<http://www.fondation-enseignement.be/>
- Plateforme Entr'apprendre
<http://www.entrapprendre.be>





GOOGLE / TEACH FIRST INTERNSHIP PROGRAMME [UK]

The initiative

The [Teach First Internship programme](#) offers computer science graduates (on a prestigious teacher recruitment programme) an internship at Google, with a view to tempting them into a career in teaching. Teach First has teamed up with the tech giant to give new recruits the chance to carry out placements at its London headquarters, prior to starting their teacher training. It is expected that the chance to participate in a short work placement at Google will act as a sufficient draw for graduates to tempt them into a career in teaching, rather than going into industry.

The need for more computer science teachers at both primary and secondary level has substantially increased in the UK, following the government's decision to introduce (in 2016) a new computing curriculum for all 5 to 14-year-olds. An improving economy, coupled with a growing need for graduates in the technology and digital industries, has made the recruitment of computer science teachers particularly challenging.

In addition to investing in new teachers, Google is also working with [Computing at School](#), [Raspberry Pi](#) and [Code Club Pro](#) to provide the necessary computing skills to existing teachers. Google and Teach First started working together in 2012, prompted by a severe shortage of teachers in ICT and science subject areas. During the three-year partnership, Google has helped fund training for over 100 STEM teachers, reaching 25,000 children in schools across the UK.

How does it work?

Google hosts 60 teachers for internships during the summer in its London offices in the framework of Teach First.

Google has pledged £300,000 to Teach First over three years (2015-2018). This will be

used to provide graduates with two-week placements at the computer company over the summer as a way to help broaden teachers' understanding of the sector as well as inform them about its own work in education.

Benefits for teachers

The practical work experience not only helps bring classroom lessons to life but also gives participants first-hand interaction with and access to Google products, managers and engineers who share their knowledge and enthusiasm for computer science.

The initiative gives teachers the opportunity to see how the company works, which can help better inform their teaching. Giving people the chance to experience the workplace makes for better leaders and better teachers. By spending time at Google, teachers are enabled to remain on the cutting edge.

This initiative is also useful for Google as it allows the company to see how teachers work and to understand what is going on inside the minds of kids.

Supporting structures

During the teacher's internship at Google, several experts who act as mentors support them.

Useful information

- Teach first
<https://www.teachfirst.org.uk/>





KENAN FELLOWS PROGRAM [NORTH CAROLINA, USA]

The initiative

Founded in 2000, the [Kenan Fellows Program for Teacher Leadership](#) addresses the critical need for high-quality professional development for educators and is the largest STEM-focused teacher-leadership programme in North Carolina. Established from a community effort to address the retention of effective maths and science teachers in the Research Triangle region, today the Kenan Fellows Program is nationally recognised as a model for industry-education partnerships.

The mission of the programme is to advance K-12 STEM education by providing educators with relevant, real-world professional learning and leadership development, through innovative collaborations with partners committed to 21st-century education and to workforce preparation.

Approximately 50 outstanding K-12 teachers from across the state are selected annually for this yearlong programme. Key components are a three-week summer internship with a mentor in a research or applied STEM setting combined with 80 hours of professional development that builds leadership capacity and promotes curricular design bridging STEM at work with STEM at school.

The programme taps the wealth of professional expertise in North Carolina's private sector, universities and community colleges to enrich learning opportunities for teachers and students. Teachers, researchers and businesses collaborate to make science and maths education relevant, engaging and, most of all, effective.

Kenan Fellows are catalysts of change, driving innovations in STEM education that will inspire future generations of great inventors, leaders, and thinkers. Today, there are nearly 400 Kenan Fellows across North Carolina and beyond.

How does it work?

The Kenan Fellows Program for Teacher Leadership, and its partners recognise the critical need to develop and empower high-quality teachers who, in turn, make learning more authentic for students. The programme bridges the gap between K-12 education, industry and research by immersing teacher-leaders in highly technical and/or locally relevant STEM work experiences and by supporting them as they design methods for transferring their learning back to the classroom. Kenan Fellows are given unprecedented opportunities for networking, professional growth and leadership development.

The Fellowship begins with a summer internship in a higher education or industry setting such as scientific research, engineering, agriculture, biotechnology, health care, aviation, communications technology, high-tech manufacturing and more. The internship is the centrepiece of the programme and is supported by 80 hours of professional development that focuses on building leadership capacity and instructional strategies for integrating data literacy, digital learning and project-based learning.

The Kenan Fellows Program offers tailored relevant professional development to its Fellows, thanks to the volunteer support of a steering committee of educators from the Kenan Fellows Program Network.

Companies or foundations involved in the programme are Bayer, GSK, Merck Foundation, Biogen Foundation, Kenan Institute NC State University, Freedom Systems Center, Farm Bureau New Hanover, Good Night Educational Foundation, NISS Pee Dee Electricity, NC Electric Cooperatives, PLY GEM, SAMSI, Syngenta, etc.

Benefits for teachers

Kenan Fellows receive a \$5,000 stipend as part of the Fellowship award and 80 hours of professional development focusing on building leadership capacity and instructional strategies for integrating data literacy, digital learning and project-based learning. Through this, Fellows learn to:

- Deepen content knowledge through an immersive internship in a local industry or research lab setting.
- Learn about career pathways and STEM skills needed for students to succeed in the local and state workforce.
- Collaborate and connect with other educators, business leaders and university researchers.

Overall, Kenan Fellows develop better STEM teaching, communication and advocacy skills. Moreover, teachers become better equipped with the resources and tools to connect students' ideas with authentic STEM experiences. Thanks to this, more students pursue higher education options and careers in STEM fields, becoming the next

generation of great inventors, leaders and thinkers. Moreover, teachers also have the opportunity to engage with other educators, community leaders and policy makers to promote high-quality instruction in schools.

After completing the formal portion of the programme, Kenan Fellows achieve more leadership positions in their schools, districts and communities. Teachers who complete the programme say they feel a deeper connection to their community and grow professionally as part of a statewide network of teacher-leaders.

Supporting structures

The Kenan Fellows Program supports exceptional teachers through tailored professional development, mentoring and internships. Building and sustaining partnerships is at the core of the programme.

The centrepiece of the programme is a five-week summer internship that gives Fellows the opportunity to learn from Mentors in laboratories and industries. Together, Fellows and Mentors develop a strategy for turning the internship experience into valuable teaching tools that can be implemented in their classrooms as well as shared with other teachers across the state and nation.

This unique collaboration offers a valuable experience not only for the Fellows but also for the Mentors, who gain a stronger understanding and appreciation of the K-12 education profession.

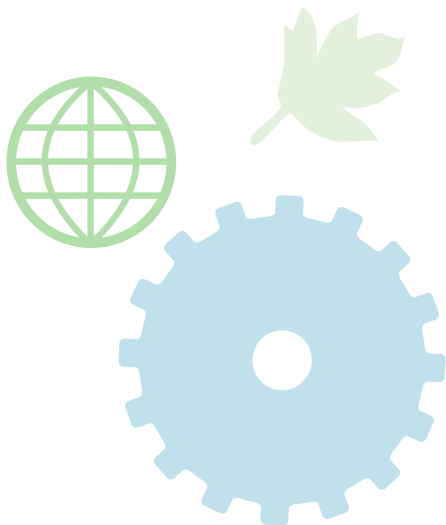
How is the programme evaluated?

An external firm, [EvalWorks, LLC](#) evaluates the Kenan Fellows Program based on a plan developed in conjunction with programme staff. Findings from the evaluation concerning Impact and Professional Development include the following:

- 100% of Fellows said the programme made them a better teacher;
- 100% of Fellows said they now have the skills to work with business leaders and other stakeholders;
- 98% of students said a Kenan Fellow got them more interested in careers in maths and science;
- 98% of Kenan Fellows said they now have the knowledge and skills to be a mentor for new teachers;
- 97% of Kenan Fellows said networking with North Carolina teachers improved their teaching and leadership skills;
- 90% of Fellows remain in education five years after completing the programme.

Useful information

- Kenan Fellows Program for Teacher Leadership
<https://kenanfellows.org/>
- Kenan Fellows Program for Teacher Leadership evaluation reports archive
<https://kenanfellows.org/evaluation-report-archive/>





What is the initiative?

Through a teacher's business-experience program, the project Lehrer in der Wirtschaft (Teacher in Business) offers secondary school teachers (gymnasium teachers) the opportunity to get a real sense of the diverse work carried out within a company.

The main objective of the initiative is to improve the relationship between school and business (on a sustained basis) and to strengthen awareness, among both teachers and students, of how companies work.

Since 2001, more than 120 high school teachers have engaged in this initiative, through the Bavarian Industry Association (vbw) and the Bavarian State Ministry of Education, Science and the Arts.

How does it work?

The project offers educators the opportunity to be "on leave" for a period of half a year or of an entire year while they become temporary employees in a company, who will contribute in full to their remuneration. During this period, teachers get to work at a company and are given responsibilities in different areas, such as human resources, training and/or public relations. Through this experience, teachers get an insight into the working world of e.g. the metal and electrical industry, in aircraft construction or in the car industry.

After completion of the internship, participant teachers will return to their home schools. However, and in order to promote the transfer of experiences from the business world to their schools, they will continue to work on project assignments for a year (for example, developing a concept for professional orientation at high schools).

The timeline of the project guarantees its sustainability and efficacy and is organized as

follows:

1. December - January: Teachers' application to the Bavarian Ministry of Education regarding project participation.
2. February - May: Teachers' invitation to apply to the company.
3. September - onwards: 12 months cooperation in the company.
4. New school year: Teachers' return to the school.
5. Implementation of the project and cooperation at the school.
6. Maintenance and development of contact between the school and the company.
7. Bringing of the information and knowledge into school lessons.

In addition, a supporting programme (which includes seminars and workshops) is put in place throughout the length of the program. This is organised by the Educational Association of the Bavarian Economy (bbw e. V.)

Benefits for teachers

Teachers will be able to collaborate with companies and to become experienced in project management, time management, teamwork, and budget planning; skills that can be strongly beneficial in terms of school management/organization. They will become empowered to act as multipliers to sensitize pupils about business topics as well as to support them in professional orientation terms.

Schools will also benefit from teachers participation in the program, as the dialogue between schools and industry is strengthened. Indeed, schools will be able to make personal contacts with the company, making cooperation and partnerships between school and business easier.

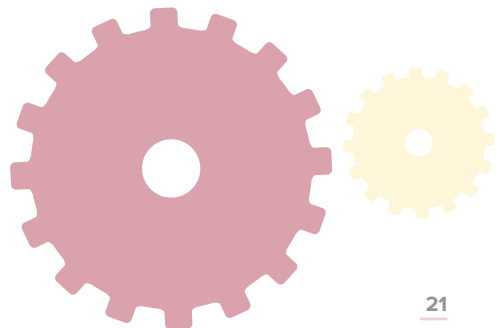
The companies involved receive highly motivated and capable temporary employees, they get to know the framework conditions of schoolwork better and to intensify dialogue with schools. This can lead to early contacts with future generations and future job applicants.

Supporting structures

The initiative is supported by the Bavarian Industry Association (vbw) and the Bavarian State Ministry of Education, Science and the Arts and will be organised by the Educational Association of the Bavarian Economy (bbw e. V.).

Useful information

- Lehrer in der Wirtschaft (vbw web page)
<https://www.vbw-bayern.de/vbw/ServiceCenter/Wirtschaft-und-Gesellschaft/Soziale-Marktwirtschaft/Lehrer-in-der-Wirtschaft.jsp>
- Lehrer in der Wirtschaft brochure:
http://www.bildunginbayern.de/download/LidW-Schulleitung_2011_Flyer.pdf





PROFESSEURS EN ENTREPRISE [FRANCE]

The initiative

The [Professeurs en entreprise](#) initiative organises half- to one-day visits in R&D (Research and Innovation) companies or research centres. They are intended for teachers and other key professionals in school education such as inspectors (IEN and IA-IPR), heads of schools, STEM counsellors (CAST) or innovation counsellors (CARDIE), pedagogical advisors and representatives of the Ministry of Education. These visits always take place in one week during the school year and they aim to create time for exchanges between professionals in education and in R&D departments and centres of industry or businesses.

The overall objective of this initiative is to introduce the world of education to the industrial and technological spheres as well as to less well-known professions and careers, in order to stimulate interest in scientific and technical studies and careers among students.

These visits offer these education target groups the opportunity to discover specificities of the life and activities of each company. French companies welcome the visitors and offer them a space to exchange information with scientific managers, engineers, researchers and HR managers.

For the eighth edition, more than 120 industrial, R&D and production sites were open for half a day or a full day, with 1,300 teachers and other key education professionals attending. The following companies were involved: Airbus, Arkema, Danone, EDF, IBM, L'Occitane, Michelin, Sanofi, SNCF, Suez Environnement, Saint-Gobain, Sanofi, Solvay, Toyota, Valeo, and many SMEs.

How does it work?

This initiative has been organised by the [Foundation C. Génial](https://www.cgenial.org/), since 2008. The Foundation was created in 2006 by six major companies: Areva, Airbus Foundation, Orange, Schlumberger, Technip and SNCF. Faced with the disengagement of young people from scientific and technical studies and careers, these companies are mobilising to raise awareness of STEM studies, careers and professions.

The initiative “Professeurs en entreprise” is presently supported by many large companies such as Schlumberger, Areva, Technip, Fondation Airbus Group, SNCF, Orange, Amgen, Arkema, IBM, Solvay, EDF Schneider Electric, Fondation l’Oreal Criteo, Ciments Calcea, Avril, Arcelor Mitteal and CEA.

Benefits for teachers

The visit programme allows teachers and other professionals in education to discover the richness and diversity of professions in industry R&D departments and to share the information gathered with fellow teachers and their students. The teachers and the other target groups get to see the importance of R&D as a major contribution to innovation in companies in particular and to the economy as a whole.

Experience shows that this initiative encourages links between schools and enterprises, and particularly with R&D departments and research centres. Teachers highlight the information they receive. This will also (directly or indirectly) contribute to improving young people’s employability.

Supporting structures

After running for eight years, the initiative has become very well-known and well appreciated. For that reason, most of the regional educational authorities (Académies) have integrated these teacher visits to companies into their educational professional development activities, in the Plan Académique de Formation or in Regional Continuous Development Plans.

Useful information

- Foundation C. Génial <https://www.cgenial.org/>
- Person in charge of the initiative: Hélène Chahine
E-mail address: contact@cgenial.org





STAR STEM TEACHER AND RESEARCHER PROGRAM 2017 [USA]

The initiative

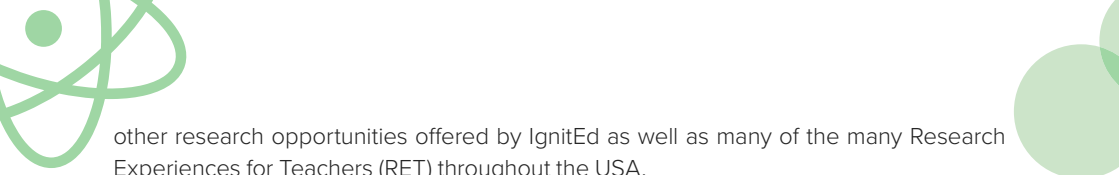
The STAR Program is run by [CESAME of the California State University \(CSU\)](#). It aims to produce excellent K-12 STEM teachers (pre-service) teacher-students and teachers by providing aspiring teachers with opportunities to do authentic research while helping them translate this research experience into classroom practices. STAR also supports the continued development of STAR Teacher-Researcher Fellows with ongoing professional development and networking opportunities.

STAR is a nine-week paid summer research experience programme for aspiring K-12 STEM teachers. Undergraduates on a teaching path, undergraduates in a STEM field considering a career in teaching, Masters' students, teaching interns and credential candidates are encouraged to apply.

To be eligible to enter the STAR Program, you:

- must be at least 18 years old by the start of the programme;
- will have entered at least your junior undergraduate year by the start of the programme;
- must be a student or alumnus of any CSU campus, a US Citizen, and a pre-aspiring teacher, teacher intern, or a STAR alumnus with two or fewer years of participation in STAR and two or fewer years of full-time teaching experience.

First-time STAR participants will be pre-service teachers (i.e., future teachers who have not yet worked as a paid, full-time teacher). However, STAR alumni are encouraged to participate in up to three STAR experiences, provided they have not been teaching for more than two years. If you have already been employed as a teacher, there are



other research opportunities offered by IgnitEd as well as many of the many Research Experiences for Teachers (RET) throughout the USA.

Selected teachers spend nine summer weeks working full-time (40 hours per week) with a mentor and a research team on innovative projects from a huge range of disciplines. Each week they will participate in an education workshop and will carry out activities focused on transferring their lab or field experience to the classroom. Each Fellow will create a research presentation (a poster or a short oral presentation) for the STAR Research Conference.


The programme requirements are very specific:

- Participate in the entire 9-week summer research Fellowship (40 hours' work per week);
- Make arrangements and pay for one's own housing;
- Prepare and present a research product (a poster for first-time Fellows) at the lab site and at the STAR Research Conference. Then, submit an electronic copy of their research for public display;
- Develop and submit a K-12 Lesson Plan connected to their research;
- Participate in weekly workshops focused on STEM teaching as part of the 40 hours per week commitment;
- Participate in STAR events, including a webinar and/or half-day regional seminar providing with an orientation to STAR and a discussion of the teacher-researcher identity and the Research Conference involving research presentations, professional development opportunities and social events;
- Participate in teacher-researcher community-building and cohort activities (in person and online);
- Participate in STAR Program evaluation activities, before, during and after the programme;
- Have health insurance coverage during the entire Fellowship period.

How does industry do it?

A team of funding partners (companies), in addition to research mentors, lab site staff, workshop facilitators and STAR staff support each STAR Fellow. Each of these partners joins in the efforts as they recognise what great catalysts for positive change STAR Fellows are.

The research mentors in the labs are PIs running various research programmes at partner lab facilities. Fellows conduct their own innovative research project (within the company) addressing a question faced by the research group. It is rarely possible to know what specific project a teacher (or Fellow) may work on in advance. STAR teachers have to be excited about research in general, open to new experiences, eager to gain new skills and able to overcome challenges working independently and with teams.



While STAR's ultimate goal is to provide a better learning experience for K-12 STEM students, the funding partners provide with support in many other ways. They help research facilities solve research problems in a number of discipline while training teacher/researchers and improving industry-academia relations. They help early career teachers distinguish themselves to employers and improve classroom connectivity through professional conferencing. Finally, they help school districts adapt to Next Generation Science Standards and Common Core curriculum shifts by providing Fellows, who have been specifically trained to bring innovative investigation approaches to their classrooms.

The STAR Program office and Lab Sites work together closely to match applicant skills and interests with the wide variety of projects available. Lab Sites continually try as much as possible to respond to the needs of the applicants. However, labs move at the speed of research and it is usually not possible to list all of the projects available in advance. Lab Site Coordinators or Research Mentors interested in specific teachers, for specific research activities, will contact the selected teachers directly.

Benefits for teachers

Teachers have to challenge themselves to work hard and to learn new skills while advancing real science in a field that interests them.

Through participation in the STAR Program, they meet excellent research professionals and immerse themselves in the culture of science. Moreover, they acquire knowledge, skills and competences that they can transmit to the classroom. Finally, they can raise awareness and interest about the work of researchers among students at their school. Finally, they acquire 21st-century skills such as critical thinking, creativity, teamwork, communication and problem-solving skills. In the classroom, Fellows will be able to contribute to student career counselling. They will also be able to support their school and their fellow teachers in strengthening industry-school cooperation.

Overall, project activities will be beneficial to all partners involved. The labs will benefit from teachers' contributions to help answer pressing questions while the students will benefit from the teachers' knowledge on how science works in the real world. This definitely has an impact on the interest and motivation of both teacher and students in relation with STEM disciplines and interdisciplinary work.

Supporting structures

Each STAR Fellow receives a stipend paid in regular intervals. The funding available and the costs of living differ in each area so the amount of stipend above the base of \$4,500 (\$500/week for nine weeks) varies.

Fellows staying in a family home or not relocating receive an additional \$500 to offset

expenses. Those relocating more than 50 miles to participate in the programme receive additional support depending upon estimates of housing costs. These amounts vary from year to year as funding and actual housing costs vary.

How is the programme evaluated?

STAR is evaluated by the Cal Poly Center for STEM (CESAME), which is actively trying to enhance the evaluation and assessment efforts of STEM activities. Over the past decade, the STAR Program has provided over 550 paid summer research experiences at national research facilities (NASA, NOAA, NSF, DOE, DOD, USGS) and other university laboratories to over 420 aspiring STEM teachers.

In addition to conducted pre- and post-summer evaluations of STAR participants, Cal Poly Centre has also begun to develop a longitudinal tracking system to investigate the following impacts of the STAR Program: teacher recruitment and retention, classroom practices, K-12 STEM student interest, teacher-leadership, and professional networking among STAR Fellows. It has administered longitudinal surveys during both 2011 and 2015 and is currently creating a database that will allow STAR Fellows to update contact information, career trajectory details, and additional survey items.

STAR is just one of several teacher recruitment and preparation efforts coordinated by CESAME. It also offers several early field experience opportunities to pre-service teachers and works with partner school districts to provide teacher professional development to cooperating teachers. Over the past year, a database system has been developed to document all of the interventions that the teachers participate in. This database will be linked to teacher credentialing and teacher employment data collected by the School of Education of CSU to track the impact of interventions on induction into the teaching career.

Useful information

- Cal Poly (CESAME) Center for Engineering, Science and Mathematics Education <http://cesame.calpoly.edu/>
- STAR STEM Teacher and Researcher Program <http://star-web.cosam.calpoly.edu/about>
- Main contact person: STAR Teacher and Researcher Program, California Polytechnic State University, San Luis Obispo, 1 Grand Ave, CESAME, San Luis Obispo, CA 93407. Phone: 805.756.2875. E-mail address: star@calpoly.edu



STEM INSIGHT [UK]

The initiative

Recent studies have shown that teachers are one of the most important influences on a student's career choice. STEM Insight has been developed to give staff in schools and colleges a unique chance to experience work in modern industrial or academic settings and use this insight to enrich the teaching and learning of STEM subjects. The programme provides participants with a wealth of knowledge and allows them to confidently contribute to the careers strategy of secondary and post-16 students.

Participants have the chance to attend either a leading UK industrial or university setting over a five- or ten-day placement:

- Insight into industry: learn how all parts of the business work, what roles and skills are needed and discover the variety of routes into careers.
- Insight into university: learn about the rapidly evolving and developing STEM disciplines and commercial opportunities that arise from research in universities.

Supported by a package of face-to-face and online Continuing Professional Development (CPD), STEM Insight works with participants to develop their experience into a strategic plan that can be implemented in their school or college.

State-funded schools and colleges receive generous bursary support from Project ENTHUSE to cover the cost of participating in the scheme.

Placements can be hosted in Scotland, Wales and Northern Ireland and in the following parts of England: North West, Yorkshire, Humber and North East, Central England, London and the South East and South West.



How does it work?

A flexible approach has been developed to make joining the STEM Insight programme as easy as possible:

- Employers/universities: a firm or university can get involved and host placement(s) by contacting insight@stem.org.uk. Once the placement is finalised, it is then promoted through the STEM Learning website and our network of partners and ambassadors across the UK.
- Teachers/staff: staff who are interested in attending the STEM Insight programme can use our interactive map to find a location and host, and then simply apply online.
- Schools: a school or college can also contact us to request a placement near them if there is not one already available. STEM Learning will aim to secure a local employer to match their requirements. If there is an existing school or college/employer partnership, STEM Learning will offer access to the STEM Insight programme to further develop an existing partnership.

Benefits for teachers

The STEM Insight programme benefits participants immensely and impacts positively on their colleagues, school or college and their students. The experience enables participants to learn more about diverse career paths and opportunities for their students, as well as providing them with workplace contexts that link to the curriculum. STEM Insight into industry and into university both:

- give a unique chance to experience STEM work in modern industry/university and use this knowledge to enrich the teaching of STEM subjects;
- are an invaluable CPD opportunity which equips schools and colleges to respond to the Government careers strategy and transform careers guidance;
- provides teachers, lecturers, managers and technicians with a better understanding of the breadth of STEM-related occupations within the industrial/university sectors of the UK, raising awareness of career paths and progression routes;
- foster strong links between schools, colleges and industry;
- build a community of practice, with a network of school/industry experts who can support other colleagues in schools and colleges.

“Even in the short term there are have already been benefits, but I believe that the breath-of-fresh-air approach from the STEM Insight programme will be long-lasting on a

personal level and have measurable effects in the college” (Catrin Williams, Cavendish Nuclear placement, October 2016).

Supporting structures

The STEM Insight programme makes all of the arrangements necessary to help both the employer and teacher, supported by an underpinning CPD programme.

State-funded schools or colleges receive generous financial support to cover the cost of participating in the programme from Project ENTHUSE. Once the programme is completed, the organisation will receive bursary funding of £1,000 for a five-day placement or £1,750 for a ten-day placement. A small fee of £250+VAT for participating in STEM Insight is required.

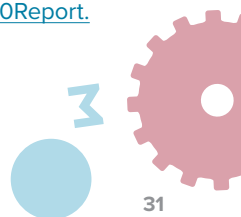
Supported by a package of face-to-face and online CPD, STEM Insight works with participants to develop their experience into a strategic plan that can be implemented in their school or college.

You can read case studies from some of our previous participants of STEM Insight, giving you real-life examples of their experience and what they gained from being part of it: <https://www.stem.org.uk/elibrary/resource/391684/stem-insight-case-studies>.

“I now know that until you step through the doors of a company, you can’t really understand what you are actually preparing young people for” (Marie Jobson – Careers Education, Information, Advice and Guidance Lead).

Useful information

- STEM Insight UK
<https://www.stem.org.uk/stem-insight>
- Company contact
insight@stem.org.uk
- National STEM Learning Centre and Network
https://www.stem.org.uk/sites/default/files/pages/downloads/STEM%20Insight%20%20Teacher_overview.pdf
- Careers Guidance: Guaranteed Summary Report of online survey prepared for the Association of Colleges; Funded by The Skills Show, January 2014.
<https://www.aoc.co.uk/sites/default/files/Freshminds%20Summary%20Report.pdf>





STEM TEACHER INTERNSHIP PROGRAMME DCU AND ACCENTURE [IRELAND]

The initiative

A first-of-its-kind internship programme, specially designed to give pre-service teachers hands-on industry experience of working in a STEM role in industry, so that they are better positioned to provide guidance and encouragement and bring their experience to life in the classroom.

This novel programme aims to enable pre-service teachers from the third year of their BSc in Science Education (SE3) to better inform their students – and in particular their female students – about careers in STEM, by giving teachers the chance to work in industry for three months full-time. The student teachers engage with educators who are at the cutting edge of knowledge and practice in 21st-century education, particularly in the area of STEM education.

The programme is the result of research reports carried out in 2013 and 2014 by Accenture on attracting more girls into STEM, which showed that while the vast majority of girls appreciate that STEM subjects create a lot of career opportunities, stereotypes persist and a high proportion of them believe that the subjects are too difficult and better suited to males.

Teachers were identified as key influencers on students' subject choices; yet three quarters of teachers surveyed do not consider themselves influential. One of the central recommendations emerging from the report was that industry needs to engage with teachers to support and inform them, and now Accenture Ireland and Dublin City University (DCU) have come together with the 30% Club Ireland to take this action.

The pilot scheme was initiated by Dr Eilish McLoughlin, School of Physical Sciences and Director of CASTeL at DCU in partnership with Accenture and the 30% Club Ireland.

The Club runs a number of very specific and targeted initiatives that look to widen the pipeline of women at all levels, from “schoolroom to boardroom.”

How does it work?

Accenture has designed the paid, three-month pilot internship programme, which enables five SE3 trainee teachers to take up positions as summer interns within the company’s technology practice, working on real-life client projects as well as in Accenture’s recently established Centre for Innovation. The three months are a mixture of project-based work and exposure to all areas of Accenture’s business.

During the course of the programme, five trainee teachers (each in their third year of studying for a BSc in Science Education) take up positions as interns within the company’s technology practice for the summer, working on real-life client projects. For ten weeks of the 12-week programme, the trainee teachers get to work as part of existing client service teams on real-life technology projects, across public and private sector clients, in industries such as financial services, life sciences and health, and public service.

During the internship, trainees also benefit from core training modules and mentors. They are also provided with on-the-job training and with access to business leaders to get a concrete picture of what industry is all about. The internship programme is structured in three stages:

- Stage 1: Induction and orientation: insights and an overview of different business areas of Accenture. STEM mentoring circles are set up involving Accenture employees and students (weeks 1 and 2).
- Stage 2: Implementation of on-the-job training with shadowing of Accenture employees and real client-facing work with clearly defined deliverables.
- Stage 3: The internship is concluded with a reflection week and a presentation made by the students involved (week 12).

Benefits for teachers

This programme offers teachers opportunities to enhance their scientific knowledge as well as core competences such as critical thinking, communication, collaboration and connections to the real world. The SE3 students involved in the pilot programme will be future teachers of Physics, Chemistry and Mathematics at second level who, thanks to the programme, get the opportunity to apply their STEM knowledge and skills from undergraduate education at DCU to solve real-world problems. This experience will reinforce and deepen their knowledge and understanding of STEM.

Teachers benefit from hands-on and minds-on industry experience in the sector so that they are better positioned to provide guidance and encouragement and to bring their

experience to life in the classroom. The future teachers are also much better prepared to give STEM career/higher education study guidance and advice, especially to girls.

Supporting structures

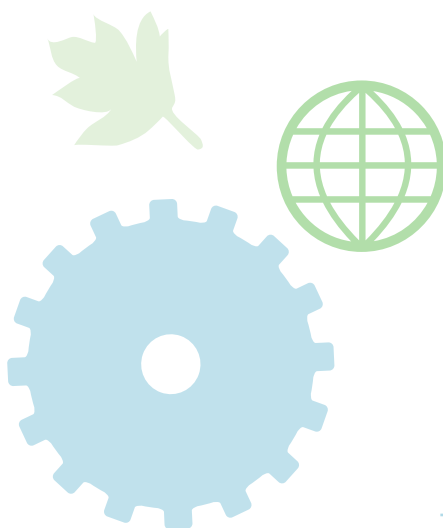
The internship is part of the normal curriculum of the third year of the BSc in Science Education (SE3), for which students get EC TS credits.

How is the programme evaluated?

Although there is no explicit information available at this moment, it may be assumed that it is evaluated within the normal assessment of the 3rd year of the BSc.

Useful information

- STEM Teacher Internship Programme DCU & Accenture
<https://www.dcu.ie/physics/news/2016/jun/stem-teacher-internship-programme-launched-dcu-accenture-and-30-club.shtml>
- Main contact person: Clara O'Connor, Technology Consulting Analyst, Accenture.





TEACHER PLACEMENT IN INDUSTRY WITH ENTREPRENEURSHIP EDUCATION FOR PUPILS [BELGIUM]

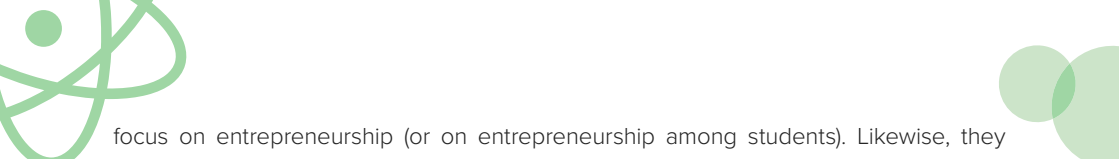
What is the initiative?

The Flemish Ministry of Education launched a pilot project for 2016-2017 to stimulate schools to send teachers on company internships. In a series of efforts related to the Action Plan for Entrepreneurial Education (2015-2019), the Ministry issued a new regulation financing 30 internships for teachers for a maximum of five days, coupled with entrepreneurial replacement activities for pupils (to replace the teacher during his or her absence). Normally, the project should involve 30 companies in different industrial or commercial areas.

The Ministry of Education hopes this measure will lower the threshold for teachers to be involved in internships and will enhance entrepreneurship education. The Ministry covers the cost of the replacement activities organised by the external organisation (making them free of charge for the school).

These replacement activities take the form of a project (set up in agreement with the school) and are carried out by an external organisation specialised in promoting entrepreneurship education, skills and competences. These organisations are all recognised by various ministries as supporting entrepreneurship education. They may be linked to chambers of commerce, sectoral organisations of commerce, trade or industry, universities or other higher education institutions. Most of those organisations are already running various initiatives such as educational projects, competitions or days to promote entrepreneurship education in schools with teachers and pupils.

These activities have to be adapted to the target audience and they must generically



focus on entrepreneurship (or on entrepreneurship among students). Likewise, they should motivate students to think about entrepreneurship and to be involved in activities that put into practice the knowledge acquired.

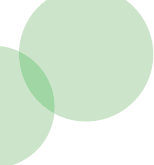
All secondary school teachers are eligible for these internships. Teachers from ASO (general secondary schools), TSO (technical schools), BSO (vocational schools), DBSO (Deeltijds beroeps secundair onderwijs/part-time vocational schools) or trainers involved in apprenticeships together with their schools or academic centres are eligible for support.

Furthermore, this programme is considered very useful for STEM teachers working in what are called STEM schools, under the initiative framed within the [STEM Action Pact](#) agreed by the Flemish government and launched by the Ministry of Education.

Finally, two projects will be available for two teachers participating in the “buso” (Buitengewoon secundair onderwijs or special secondary schools) if both the school and teachers are willing to align the replacement activities with the needs and possibilities of this specific student group and in coordination with the external organisation.

How does industry do it?

- Industry and civil society organisations have been invited to take an active part in these projects by making available five-day internships for teachers. Before the placement starts, teachers will agree with the company and with their school about the kind of activities they will be involved in. Technical or vocational teachers will be involved, as much as possible, in activities closely related to the professional jobs they prepare students for. After their placement, they must also draft a small document explaining how they will with their colleagues at school the knowledge and competences they have acquired.
- To join this initiative, teachers can contact a company/organisation to find an internship (by themselves) or can ask the Ministry or one of the educational networks (public or private) to help them find a placement or internship.
- As soon as the teacher has found an internship, he/she has to take the initiative to draft a contract between him/herself, the school and the host company/organisation. A model contract is available to schools and teachers. This contract signed by all parties will be forwarded to the Ministry of Education together with an application for financial support.
- The external organisation will contact the school and the teacher to make further arrangements for the implementation of the entrepreneurial activities that have to fit the target groups concerned. Finally, a cooperation agreement is signed between the school and the external organisation specialised in



entrepreneurial education. It takes three weeks to apply for an internship linked to entrepreneurial activities and to get the approval of the Ministry of Education.

Benefits for teachers

This pilot project directly benefits not only teachers but also their pupils. It is also expected that the placements in industry will be used especially by STEM schools. As part of the reference framework to become a STEM school the school has to strengthen its links with the world of industry and commerce.

This pilot project directly benefits not only teachers but also their pupils. Through a five-day placement in a company, teachers will acquire new knowledge, competences and skills that will be equally useful in the classroom. This will strengthen cooperation between schools and companies and is specially addressed to general secondary schools with no tradition of cooperation with companies.

This pilot project is beneficial for pupils in two ways. First, participating teachers will be able to give students more and better information about careers and studies, especially in the field of STEM. Secondly, the pupils have the opportunity to work on entrepreneurship in various ways, stimulating them to be entrepreneurs.

Such placements could be particularly useful to schools that want to become STEM schools applying the reference framework for STEM schools developed by the Ministry of Education: [https://onderwijs.vlaanderen.be/sites/default/files/atoms/files/STEM-kader%20\(Engels\).pdf](https://onderwijs.vlaanderen.be/sites/default/files/atoms/files/STEM-kader%20(Engels).pdf)

Supporting structures

There have already been many opportunities for teacher placements in companies in both secondary and higher education. However, the main obstacles to teachers' involvement are the continuing difficulties in finding replacement teachers to cover absences.

The project is linked to the latest Action Plan for Entrepreneurial Education 2015-2019 and is run and supported by the Flemish Ministry of Education. This action plan intends to inspire and support all those in education who want to promote entrepreneurial education and entrepreneurship and give them a framework for action. Within this action plan 2015-2019, there is a chapter on internships or placements for teachers.

All the entrepreneurial activities linked to schools have been described in detail in a study: [Ondernemend leren en leren ondernemen: Pleidooi voor meer ondernemerschap in het onderwijs](#) (Entrepreneurial learning and learning to become an entrepreneur: a plea for entrepreneurship at school), Wouter Vandenberghe (2007), commissioned by the King Baudouin Foundation in the framework of the Accent on Talent initiative in the years 2000 and following.

This study coincided with [Leren van elkaar: samenwerking tussen scholen en bedrijven](#) (Learn from one another: cooperation between schools and industry/companies) by Wouter Vandenberghe on cooperation between school and industry (2006).

How is the programme evaluated?

Teachers and companies involved in the placements have to complete an evaluation form at the end of the placement. The pupils and the schools that benefit from the replacement activities organised in the field of entrepreneurship education will also be invited to complete an evaluation form. The Ministry of Education intends to evaluate this pilot project before mainstreaming it for more teachers.

Useful information

- Pilot Project: Klasactiviteiten ondernemingszin tijdens afwezigheid leraar op bedrijfsstage (Replacement activities focusing on entrepreneurship education while a teacher is on a placement/internship):
<https://onderwijs.vlaanderen.be/nl/klasactiviteiten-ondernemingszin-tijdens-bedrijfsstage-leraar>
- Report on Entrepreneurial education In Flanders: Ondernemend leren en leren ondernemen: Pleidooi voor meer ondernemerschap in het onderwijs (2007)
http://www.competento.be/sites/default/files/imce/documenten/leren_ondernemen_def.pdf
- Main contact person: Hilde Denolf, Flemish Ministry of Education. (hilde.denolf@ond.vlaanderen.be)

A photograph of a male teacher in a dark suit and tie, smiling and gesturing while standing in front of a whiteboard. He is addressing a group of students whose backs are to the camera. The students are seated at desks, and a laptop is visible on one of them. The setting appears to be a modern classroom or meeting room with large windows in the background.

TEACHER PLACEMENT INITIATIVE IGNITED SUMMER FELLOWSHIPS PROGRAM [USA]

The initiative

The [IgnitEd](#) Summer Fellowships Program (formerly IISME) is a full-time placement that offers teachers the opportunity to experience first-hand what it takes to be successful in today's industry and research environments. During an eight-week full-time programme, teachers are matched with a leading company, university or research organisation where they work closely with an experienced mentor to complete a challenging real-world project for their host organisation. Fellows gain skills, share experiences and develop a tailored STEM curriculum to engage and inspire their students.

IgnitEd is a non-profit organisation in Silicon Valley, focused on transforming STEM education. It was founded in 1985 by a consortium of technology companies and universities and it was originally called Industry Initiatives for Science and Math Education (IISME). Its mission is to connect business leaders and scientists with teachers to transform the classroom experience, inspiring students to become the next generation of innovators. Each summer, for the past 32 years, the IgnitEd Summer Fellowships Program has recruited companies, universities, and research labs to host local educators who want to see how STEM concepts are applied to real-world problems.

Over the course of the summer, IgnitEd coaches trainee teachers to incorporate learnings into new curriculum to engage and inspire students when they return to the classroom. IgnitEd provides Fellowships to K-16 teachers representing every subject. The vast majority of the teachers whom IgnitEd serves are high-school and middle-school STEM teachers, although Career Technical Education, community college instructors and elementary school teachers also participate in smaller numbers. At least 30-35% of the teachers served teach educationally disadvantaged students in underperforming schools.

Teachers who apply to IgnitEd typically have at least a Bachelor's degree in the subject they teach and many have advanced degrees. Most are technically savvy and, at a minimum, are comfortable with MS Word, Excel and PowerPoint. Besides expertise in at least one subject and a basic, comprehensive working knowledge of related subjects, teachers possess many transferable skills and qualities that have value in the corporate or university workplace.

How does it work?

Teachers are eligible to apply for the IgnitEd Summer Fellowship Programme if they meet the following requirements:

- Teach in the IgnitEd service area;
- Are currently teaching any grade, K-16, full-time in Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, Santa Cruz or Solano County;
- Are contracted to teach full-time during the following school year in the IgnitEd service area;
- Are committed to teaching;
- Have completed at least two years of full-time teaching in any discipline by June of the current school year;
- Are committed to continuing to teach for at least the next three years;
- Have a legal right and necessary documents to work in the US in a non-teaching job;
- Are able and available to work full-time in a non-teaching job (teachers must be available full-time during standard business hours for the Fellowship period).

IgnitEd Fellows are required to:

- Complete an eight-week Fellowship, working eight hours per day, 40 hours per week during standard business hours. IgnitEd may approve minor adjustments to the length of the Fellowship. At least six weeks of any Fellowship must be held during the core eight-week Fellowship period (12 June-4 August 4, 2017).
- Complete a Fellowship project assigned by the Host organisation.
- Design and implement an Education Transfer Plan (ETP) for applying the summer experience during the academic year. Earning a passing score on the ETP rubric is required for the Fellow to earn all grant money and be eligible for future IgnitEd Fellowships.
- Attend the following meetings to support Education Transfer:

- IgnitEd Orientation
- One-on-one sessions with IgnitEd Coach
- Community Group meetings
- Complete a survey at the end of the summer and a Fellowship impact report after implementing their ETP.
- Forgo soliciting or accepting employment from their IgnitEd Host organisation and return to teaching, the following school year.

In addition to working on a corporate or research project, each IgnitEd Fellow is required to develop a specific plan for transferring the IgnitEd experience back into his or her classroom or school. This ETP could be a lesson or unit in a specific content area or in one that integrates different disciplines, a classroom project, staff development or a unit on career exploration. The ETP is designed to benefit both the IgnitEd Fellow and the education community at large as ETPs are published on IgnitEd's Community Website. Visit Sample Projects to see exemplary ETPs: <http://www.ignitededucation.org/the-experience/projects/>.

Benefits for teachers

One of the remarkable observations that teachers make year after year is how re-energised and revitalised they feel after an IgnitEd Fellowship. IgnitEd Fellow Brad O'Connor said it best: *"I started my Fellowship a mere weekend after the last day of school, and finished with only a week and half until the first day of the new school year. But when school started I hit the ground running. I had twice the energy and none of the dread. It's all a bit counter-intuitive, but it may be that I stayed in a productive mode all summer and didn't have trouble switching gears when the school year arrived."*

Teachers involved gain new skills and learn more about the latest technologies and techniques. They build relationships with the host company to set up student site visits, educational programmes and other resources. By being involved in the programme, teachers also earn professional development hours and/or university course credits. Overall, they belong to a professional community of educators, supportive of risk-taking and innovation.

Finally, teachers can earn up to \$9,000 during their IgnitEd Summer Fellowship. The gross pay will be \$7,000 in stipend for the summer. In addition, each Teacher Fellow is eligible to receive up to \$2,000 in grant money for completing an ETP and an Impact Report detailing the impact of the Summer Fellowship Program on his/her teaching practice and the results of implementing the ETP during the following school year.

Supporting structures

- During the Fellowship, a mentor is assigned to teachers – to complete a project for their host organisation – and with an IgnitEd Coach – to incorporate their learnings into new curriculum, to take back to their classroom. Hosts benefit from the immediate contributions of these capable professionals and at the same time help shape the future of STEM education.
- In addition to specific domain expertise, teacher Fellows are experienced professionals with a range of valuable skills: initiative/self-starting, leadership, flexibility, creativity, willingness to learn, and attention to detail.
- There are many ways these skills can be applied by the mentor to benefit host organisations: taking a complex or large concept/process and breaking it into components – beneficial in creating training documentation; identifying the essential concepts and problem-solving – valuable for business analysts; communicating well in oral and written form – excellent for technical writing projects and compelling presentations; organising and planning – useful for project management positions; framing questions and information gathering – crucial for projects involving research; collaborating with others to achieve a common goal – essential for human resources or community relations projects.

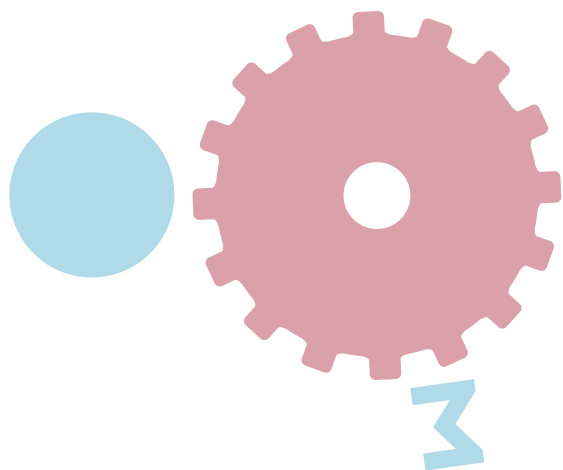
How is the programme evaluated?

Each ETP is evaluated using a rigorous rubric. This rubric is made available to all Fellows prior to the start of the Fellowship programme. Earning a passing score on the rubric is required for the Fellow to earn all grant money and to be eligible for future IgnitEd Fellowships. Each Fellow is expected to spend part of the Fellowship developing this plan and will receive support from an IgnitEd Coach. It is advised that he/she keeps the Mentor informed about any progress on the ETP as they will be asked to sign off on the final product.

IgnitEd has commissioned Quality Evaluation Designs to conduct an external evaluation of how participating in the Fellowship programme changes teachers' perspectives and behaviours. The evaluation focuses on teaching, professional development, career decision-making and understanding of workplace culture and skills. An evaluation questionnaire was mailed to all teachers involved over the past 30 years. The analysis of that questionnaire reflects the consistent, enthusiastic support the Fellowship programme has received from teachers and principals. Nearly 20% of teachers rated the Professional Development associated with IISME as transformational. Teachers report that their Summer Fellowships have an impact on their students, including increased engagement in subject matter and increased interest in STEM careers.

Useful information

- Ignite Education <http://www.igniteducation.org>
- IgnitEd Summer Fellowships Program
<http://www.igniteducation.org/programs/summer-fellowships/>
- Full programme evaluation report
http://www.igniteducation.org/wp-content/uploads/2016/01/QED_Full_Evaluation_Report.pdf
- 2016 evaluation report
http://www.igniteducation.org/wp-content/uploads/2016/01/QED_Full_Evaluation_Report.pdf
- Main contact person: Shari Liss, shari@igniteducation.org





TEACHER PLACEMENTS IN INDUSTRY [AUSTRALIA]

What is the initiative?

Teacher Placements in Industry Australia assists in enhancing school-industry partnerships through teacher placements in the private or public sector, community service or welfare organisations. Teachers from all Education Queensland schools (pre-schools, primary, secondary and special schools, including permanent full-time and part-time teachers) have the opportunity to participate in Teacher Placements in Industry. Teachers in remote areas will also have the opportunity to experience industry placements in both rural and urban locations.

The length of the placement approved by principal will vary depending on the situation, but will normally not exceed six months (cumulative) duration. This means the six months can be split into sequences alternating with teaching periods. The duration may be extended beyond six months with the approval of the Ministry of Education.

On completion of the placement, teachers are expected to contribute to relevant curriculum and/or resource development or revision at their school and to share expertise and experience with other teachers and school administrators in the school, district or state.

How does it work?

The industry partners involved agree to negotiate arrangements with the teachers and the principals of the schools on the following issues:

- to work collaboratively with relevant teacher(s), and their principal (or his/her nominee), prior to placement to plan a structured programme;
- to nominate a person to meet regularly with participant(s) for debriefing or interactive sessions during the placement;

- to meet midway through placement with teacher and teacher's principal (or his/her nominee) to discuss progress of placement during longer placements;
- to ensure that the correct procedures are followed in the event of accident or injury to the teacher;
- to notify both the participant and the principal if the industry is unable to continue the teacher placement after its commencement;
- to complete the relevant section of evaluation of teacher in industry placement form on completion of placement.

Industry will develop (in cooperation with the teacher and the school) a well-planned structured programme, which incorporates:

- determination of objectives;
- determination of specific tasks to be undertaken;
- familiarisation of the teacher with relevant workplace health and safety requirements;
- briefing workplace staff on their contribution to the participant's placement;

Providing the teacher with information relating to specific workplace requirements (e.g. security arrangements, confidentiality, lunch arrangements, safety and clothing requirements, parking, hours of work, times and duration of breaks, use of phones and other equipment, and reporting mechanisms).

Benefits for teachers

The programme stresses several benefits for the teachers, the school and the industry involved. Participating teachers are provided with opportunities to:

- acquire increased levels of industry experience to contribute to the human resource requirements for teachers of vocational education and training;
- develop ongoing networking links with the industry involved;
- develop a greater understanding of workplace issues and practices other than in school settings, such as: structure and organisation of workplaces, conceptualisation and implementation of strategic plans, application of technology, culture and ethos of workplaces, staff recruitment policies and practices, workplace development and training procedures, staff performance and appraisal mechanisms, industrial relations issues, including enterprise bargaining and workplace health and safety issues, equal employment opportunities and development of employability skills.

Industries offering placements are provided with opportunities to:

- contribute to the development of meaningful curriculum and of teaching and learning practices;
- learn more extensively about educational processes;
- assist in developing future employees' employability skills, knowledge and work ethics;
- participate in an ongoing partnership and dialogue with the school sector in terms of industry-school links, which could include organised student visits, student industry placement opportunities, joint projects and curriculum support to promote a positive public image of their industry or enterprise.

Supporting structures

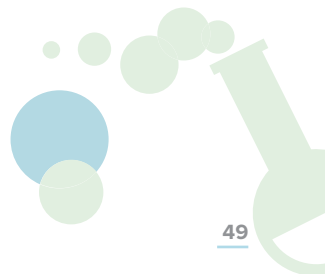
Teachers on industry placement remain employees of Education Queensland and as such will receive the same remuneration that they would usually receive if teaching in a school. The placements will not affect the length of the teaching service or related wage increments, superannuation payments and benefits, or long service entitlements. Participating teachers are regarded as undertaking official duties and hence are subject to the Code of Conduct and are covered by workers' compensation arrangements as employees of Education Queensland. The department maintains Public Liability Insurance cover specific to this activity.

How is the programme evaluated?

Every teacher participating in the Teacher Placement in Industry initiative is required to complete an [evaluation questionnaire](#). Part of this questionnaire has to be completed by the representative of the company who is involved in the follow-up of the placement of the teacher. Teacher mentorship within the company and regular debriefing sessions held with the teacher within the company are also considered part of the formative evaluation.

Useful information

- Australia: Teacher Placement in Industry
<http://ppr.det.qld.gov.au/education/management/Pages/Teacher-Placements-in-Industry.aspx>
- Main contact person
WorkforceRelations@HUMANRES.qld.gov.au





TEACHERS IN INDUSTRY [ARIZONA USA]

The initiative

Teachers in Industry integrates paid summer industry work experiences in local businesses across Arizona together with (1) a focused Master of Arts in Teaching and Teacher Education or (2) professional development credits. These activities are based in science, technology, engineering and mathematics (STEM) disciplines as well as in teacher education and training. Teachers in Industry focuses on guiding teachers to effectively bring their real-world experiences into classrooms while building in-depth and practical knowledge of the workplace. The programme is open to all Arizona STEM teachers.

Teachers learn from immersion in a real-world industry experience and gain from their exposure to these organisations. In return, companies directly benefit from the skills and knowledge teachers bring to their workforce each summer.

Teachers in Industry is an intensive real-world programme, aimed at a select group of early and mid-career STEM teachers. As a key programme of the newly formed University of Arizona (UA) STEM Learning Center, Teachers in Industry includes features that are essential for successful retention of new teachers. It is long-term, combines the best practices of teaching and learning with the expertise of the business and research community, creates a community of practice that will support teachers, and helps classroom teachers build their expertise in content and delivery of science, mathematics and technology skills within the 21st-century Skills Framework, consistent with a reformed teaching environment.

Since the beginning of this programme in 2009, Teachers in Industry has been able to provide substantial tuition remissions through grants for teachers in the Master's programme. The original grant was funded by Science Foundation Arizona, and more recently, it has received substantial funding from the Freeport MacMoRan Foundation

and the Thomas R. Brown Family Foundation, which allows the programme to cover a large percentage of the tuition for teachers in the Master's programme. It is expected that the programme will be able to continue to provide a similar amount of tuition assistance to teachers in the Master's programme, with the exact amount of that assistance dependent on the funding the programme receives.

How does it work?

Teachers in Industry offers two options to learn 21st-century skills: a summer professional development programme and a unique Master's option. The programme runs statewide with opportunities for teachers around the state to participate fully, including teachers in rural areas. Real-world industry experience, professional development and networking are provided both to increase teacher retention and to improve STEM teaching and learning.

Teachers in Industry achieves its goals by offering teachers a combination of summer work experiences in Arizona businesses and industries paired with intensive coursework that leads either to a Master's degree in Teaching and Teacher Education or to professional development credits, depending on the needs of the teachers. In addition to the summer classes, teachers in the Master's degree option also take one course in their content area each semester, leading to increased content knowledge.

Teachers work with scientists/mathematicians/engineers/computer programmers in area industries for four days per week during three consecutive summers and take education courses on the Fridays.

Both options offer the same core features:

- Work for local businesses/industries in paid summer industry work experiences;
- Earn professional rates, including benefits where needed;
- Learn how to translate summer work experiences into improving student learning in the teacher's classroom;
- Become part of a community of learners.

Benefits for teachers

The overall benefit of the programme is to better prepare students for future STEM careers as teachers experience new ways of thinking about teaching.

Benefits for teachers in both short and long term:

- Short term: the teachers are professional summer employees using STEM skills and knowledge in a business environment.

- Long term: participation in the programme transforms their teaching, producing STEM-excited students.

Highly skilled and creative STEM teachers are an asset to schools and districts across the state as well as to the businesses they work for, during the summers. Teachers involved in the programme become teacher-leaders and mentors in their schools. Moreover, some gain local and even national recognition.

Supporting structures

Participating teachers are simultaneously enrolled in a specially designed cohort of the UA College of Education's Master of Arts programme in science and maths education. Teachers in Industry courses are tailored to connect maths and science content, real work in business and industry as well as classroom teaching and student learning.

Teachers in this programme have a major in maths, science, technology or engineering. Content courses in either maths or science, which includes courses offered in the College of Science at UA as well as online courses, to be taken once per semester during the regular school year. Participating teachers complete various projects, depending on their involvement in either the Master's degree or the Professional Development options.

All teachers make extensive workplace observations relating to content, skills and practices. These observations are later developed into a teachable unit based in Problem Based Learning using the foundational principles from Understanding by Design.

All teachers in the Master's degree option research, plan, implement and collect data for an Action Inquiry (Action Research) project from the second and third summers in the programme. These projects must have a strong connection both to a practical problem the teacher faces in the classroom and to their summer work experiences. From this research, each graduating teacher develops a professional poster, which is presented at a reception hosted by a local business. They also create a single-page handout to share with attendees at this reception.

How is the programme evaluated?

Teachers in Industry has been operating successfully since 2009. Since then, it has tracked the progress of the teachers involved towards increasing expertise within the reformed teaching environment by conducting regularly scheduled classroom observations using the Reformed Teaching Observation Protocol instrument.

It has been found that the programme has a high retention rate within the teaching profession. In addition, teachers demonstrate significant changes in classroom practice, moving away from traditional teacher-centred approaches towards learner-centred classroom instruction. Teachers also build student proficiencies not only in content but also in skills such as problem-solving and collaboration with an emphasis on real-world

applications.

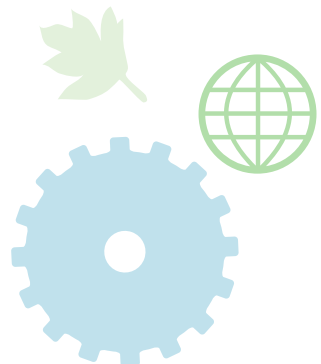
Teachers in Industry is gathering data on the interest of middle- and high-school students in STEM careers. The programme is interested in the effects teachers are having in this area, when compared to teachers who have not participated in the programme. An early analysis shows that students benefit by gaining a better understanding of STEM careers available to them, learning how businesses use 21st-century skills as well as by engaging in critical thinking, collaboration, problem-solving and creativity in the classroom. The analysis also shows that the teachers' experience in an industry workplace has motivated them to learn.

The evaluation is based on several other studies, such as:

- A review of 60 different programmes by Dubner (2006);
- A study by Silverstein et al. (2009), which has investigated systematic educational changes to assess their impact on student performance;
- The report in "Real World Experiences" (2006), focusing on the impact on students of such teacher programmes. Further information on elements of those studies or reports can be found at: <http://teachersinindustry.arizona.edu/professional-growth>

Useful information

- Teachers in Industry Arizona
<http://teachersinindustry.arizona.edu/>
- Main contact person
Dr Julia Olson, jkolsen@email.arizona.edu





TUWAS! [GERMANY]

What is the initiative

TuWaS! (Technik und Naturwissenschaften an Schulen) is an initiative by the Freie Universität Berlin and the Berlin-Brandenburg Science Academy. The aim of the project is to improve science education in primary schools through inquiry-based science education. The programme is based on teacher's professional development and providing hands-on teaching material in accordance with the curriculum.

The regional project "TuWaS!-Köln/Bonn" is operated by the Chambers of Industry and Commerce of Cologne and Bonn/Rhine-Sieg. Ideally, a company is twinned with a primary school (grade 1-4) or a lower secondary school (grade 5-6), financing the participation of that school in the TuWaS! programme. TuWaS!-Köln/Bonn offers professional development and lends the participating schools comprehensive teaching material comprising twelve topics covering the STEM areas biology, chemistry, physics and technology.

How the industry does it?

The industrial partners invite teachers and/or students to visit the company. The aims are to strengthen their partnership, to introduce and represent the company, to connect professionals with teachers in order to show and provide possible career options. This enables teachers and pupils to understand broadly that STEM careers are really interesting and cool and not for nerds.

Benefits for teachers

The obligatory professional development one-day training program enables involved teachers perfectly to conduct inquiry-based science education in their classroom. They learn competences important for teaching science. Lending the extensive and wisely by the US Smithsonian Centre developed material to schools, allows the teachers to focus on teaching and relieves them from organizing material to teach. Since more than one teacher participates, an exchange of teaching practices is possible and substitution easier. In addition, an exchange between different schools is possible, as teachers from different school mingle and meet while being taught at the professional development training sessions.

Supporting structures

The coordinator of the project establishes the co-operation between one company and one school and supports schools to communicate with the industrial partner. Furthermore, the coordinator is responsible for the public relations work, he/she organizes meetings at schools with media representatives as well as representatives of the cooperating company.

In addition, the Chambers of Industry and Commerce of Cologne and Bonn/Rhine-Sieg run a material centre, which lends teaching material on twelve topics to the school without costs for schools. The material is delivered to the schools and brought back to the material centre after half a year where it is then refurbished, looked after and delivered again.

On a regular basis the coordinator invites all involved teachers to promote exchange and best learning. Every two years a convention is held at the Chamber of Industry and Commerce of Cologne in order to promote the program and enable a vivid exchange between the representatives of the supporting companies, the regional government and other school authorities, deans, teachers, students and other interested organisations and individuals. These meetings are very important to maintain a functioning network.

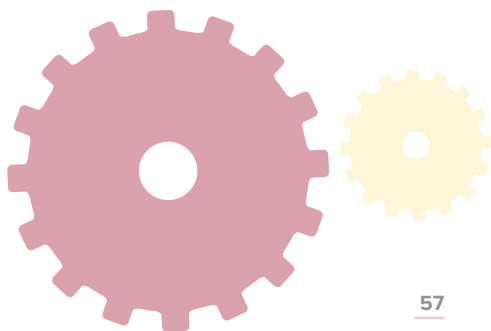
In order to discuss the further direction and the development of the project, a Community Board has been installed some years ago; the members are representatives of the Freie Universität Berlin, both involved Chambers of commerce and industry, supporting companies, the regional government, the school inspection body, deans and teachers. Since TuWaSI-Köln/Bonn is embedded in the organization of the chambers of commerce and industry, the coordinator is able to use established structures to get more companies involved.

How is the programme evaluated?

On a regular basis the professional development is evaluated by the participating bodies; in addition the education department of the Universität Hamburg conducted a 2-year evaluation of TuWaS! in Hamburg with interviews and questionnaires for teachers. The original programme by the Smithsonian Centre is widely and deeply evaluated.

Useful information

- TuWaS! In Köln/Bonn
www.tuwas-deutschland.de
<http://www.tuwas-deutschland.de/koeln-bonn.html>
<https://www.ihk-koeln.de/19047>
<http://www.ineoskoeln.de/de/tuwas>
- Main contact person: Iris Wirths and Sylvia Hüls,
 - GBFW. e.V., coordination project “TuWaS!-Köln/Bonn”, c/o Industrie- und Handelskammer zu Köln, Unter Sachsenhausen 10-26, 50667 Cologne, Germany
 - Tel. +49 221 1640-6642
 - E-mail gbfw.wirths@koeln.ihk.de





VETtLIS [MONTENEGRO]

What is the initiative?

Launched in 2016, the goal of the VETtLIS project (VET teachers as learners in the industry sector) is to build a partnership between national educational and business organisations through the establishment, design and delivery of 20 teacher placements in industry for vocational teachers, in Montenegro.

The project aims to improve the knowledge of teachers at vocational schools while enhancing the quality of vocational education programmes by (1) aligning them with the needs of industry and (2) supporting cooperation between educators, entrepreneurs and educational institutions.

Besides, through training, dissemination and steering committee activities, the project aims at reinforcing the relations between VET schools and the business sector and to improve work-based learning in schools.

How does it work?

In the first project phase, through a set of training programmes organised in enterprises, at least 72 VET teachers from 12 VET schools from different regions were trained and actively involved in the process of work-based learning.

Training programmes were spent in enterprises and lasted for a period of three to five days. During this period, and with the support of a mentor, VET teachers engaged with new work processes, technologies and equipment used in a particular relevant area.

After the completion of the training period for VET teachers, a National Conference with teachers, educational stakeholders and business sector representatives was organised to share the training results and establish future partnerships.

Benefits for teachers

Project reviews have already shown that the VETtLIS initiative crafts an opportunity to develop enhanced understanding and cooperation between businesses and specific schools. Likewise, teachers reported that, through project activities, they had learned new skills, used innovative pedagogical approaches with their students, designed new lessons, learned from staff in the workplace and even updated their professional understanding, by getting to know new technology and learning processes.

Supporting structures

The VETtLIS project is led by the Ministry of Education in Montenegro, which has defined as a main objective of its education system to develop Montenegro as a knowledge-based society using education as a crucial pillar for social and economic growth.

The project partners are the Centre for Vocational Education and the Chamber of Economy. The [Centre for Vocational Education](#) is a developmental, advisory and research institution, established to advance vocational and adult education systems and aimed at producing professionals.

The [Chamber of Economy of Montenegro](#) is a business association for the economic and overall development of Montenegro. The Chamber has successfully undertaken numerous projects with international partners and plays a significant role in the reform of the country's educational system.

How is the programme evaluated?

A fundamental role in the project is played by the five-member steering committee, whose main objective is to analyse the project results to create a regulatory framework. The document explains the responsibilities, rights and commitments of each stakeholder included in the process of CPD and work-based learning. It also specifies the status of the learner (VET teacher), the employer's obligations, the learner, the training centre and states – if applicable – any other benefits.

Moreover, during the first and second project cycles, the project coordinator visited the VET teachers (on two occasions) and consulted the teachers' mentors from each company with the objective of getting a comprehensive picture of the quality of teachers' placements included in the programme. Finally, when the placements were finalised, teachers completed the questionnaire regarding its quality.

Useful information

- ETF Continuous Development Platform website
<https://connections.etf.europa.eu/communities/community/cpd>
- Ministry of Education of Montenegro <http://www.mps.gov.me/ministarstvo>





CONCLUSIONS AND RECOMMENDATIONS

As a way to understand how companies are developing teacher placement initiatives, this STEM Alliance publication has assembled a number of relevant programmes that highlight and account for its diversity. However, while many of the initiatives included in the booklet are taking place in Western Europe (indicative of a relative lack in Eastern Europe) it has been noted that teacher placement schemes in the United States are more common and sophisticated.

In addition, most of the placements included in this publication have been organised either as a standalone initiative and/or in cooperation with private institutions, in the form of international companies. Nonetheless, there are also occasions where these have been developed through national or regional educational frameworks or as part of a programme in a tertiary level academic institution. Regarding the typology of teacher placements included in the booklet, it is quite broad, as most initiatives vary greatly in terms of duration, condition, activities, type or profile of participants and in the chosen evaluation methodologies.

As a unifying trend, most of the placements included are aimed at expanding teachers' knowledge about STEM and other technical abilities, concerning business-related skills, as well as with providing access to spaces for networking between teachers and professionals. Likewise, some aim to raise awareness of the operational realities of companies while discovering the diversity of professions in the industry and fostering and sustaining cooperation networks between school and industries.

It is undoubtedly through the provision of up-to-date knowledge on STEM careers and familiarising educators with an entrepreneurial mind-set that placements can contribute to an increase in teachers' confidence in transmitting knowledge to peers and students. At the same time, companies involved in these programmes can also profit from the benefits of attracting new generations of students into STEM careers while understanding the workforce available, allowing them to target and to train specific candidates.

In this regard, one of the main aims of this STEM Alliance booklet was to help solve the lack of awareness of career development opportunities for teachers, as more resources should be put in place to disseminate the opportunities available, specially taking into consideration the urgent need to bridge employment gaps. Recommended measures should concern transparent programmes to bridge educators' fears or concerns related to their own potential or to the company's agenda. Additionally, the provision of flexible arrangements for both teachers and companies should be a given, and collaboration with governmental bodies could be further supported, as it can ease the integration of company-sponsored programmes in school curricula and would help solve the lack of resources in schools.



SYSTEMIC

SAY YES TO STEM IN THE CLASSROOM

ABOUT SYSTEMIC

SYSTEMIC is a strategic partnership project funded under KA2 of the Erasmus+ programme. The overall objective of the SYSTEMIC project (“Say Yes to STEM In the Classroom”) is to increase young Europeans’ interest in maths, science, engineering and technology education and careers and to provide teachers with the appropriate pedagogical tools to teach STEM topics differently and in a more attractive way.



ABOUT STEM ALLIANCE

STEM Alliance – inGenious Education and industry, brings together Industries, Ministries of Education and education stakeholders to promote STEM education and careers to young Europeans and addresses anticipated future skill gaps within the European Union. STEM Alliance builds on the success of the inGenious initiative (2011-2014) to increase the links between STEM education and careers, by involving schools throughout Europe. With the support of major industries and private partners, STEM Alliance activities promote STEM jobs in all industrial sectors and contribute to build a STEM-skilled workforce. STEM Alliance aims to improve and promote existing industry-education STEM initiatives (at national, European and global levels) and contribute to innovation in STEM teaching at all levels of education.

STEM ALLIANCE 2017

COORDINATORS



PREMIUM PARTNERS



GENERAL PARTNERS



SYSTEMIC PARTNERS



www.stemalliance.eu



@stemalliance_eu



StemAllianceEU

The STEM Alliance is coordinated by European Schoolnet (www.europeanschoolnet.org) and CSR Europe (www.csreurope.org). More information: www.stemalliance.eu



SYSTEMIC is Co-funded by the Erasmus+ Programme of the European Union (Grant Agreement N. 2016-1-BE02-KA201-017360). The content of the document is the sole responsibility of the organiser and it does not represent the opinion of the European Commission (EC), and the EC is not responsible for any use that might be made of information contained.