OECD Education Working Papers No. 171

Lessons learned from
the PISA4U pilot: The online
programme for school
improvement

**Kari Dreyer,
Alexandra Cosma,
Iveta Hlinková,
Jan Hengge**

<https://dx.doi.org/10.1787/5086ce28-en>

Cancels & replaces the same document of 23 March 2018

LESSONS LEARNED FROM THE PISA4U PILOT

The Online Programme for School Improvement

OECD Education Working Paper No.171

By Kari Dreyer, Alexandra Cosma, Iveta Hlinková, Jan Henggeormation of CANDENA GmbH

This working paper has been authorised by Andreas Schleicher, Director of the Directorate for Education and Skills, OECD.

Dr. Joanne Caddy, Senior Analyst, EDU/ECS, joanne.caddy@oecd.org

JT03429044

OECD EDUCATION WORKING PAPERS SERIES

OECD Working Papers should not be reported as representing the official views of the OECD or of its member countries. The opinions expressed and arguments employed herein are those of the author(s).

Working Papers describe preliminary results or research in progress by the author(s) and are published to stimulate discussion on a broad range of issues on which the OECD works. Comments on Working Papers are welcome, and may be sent to the Directorate for Education and Skills, OECD, 2 rue André-Pascal, 75775 Paris Cedex 16, France.

This document, as well as any data and map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgement of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to rights@oecd.org.

Comment on the series is welcome, and should be sent to edu.contact@oecd.org.

This working paper has been authorised by Andreas Schleicher, Director of the Directorate for Education and Skills, OECD.

www.oecd.org/edu/workingpapers

© OECD 2018

ACKNOWLEDGEMENT

The PISA4U programme was made possible by the William and Flora Hewlett Foundation, the Deutsche Telekom Stiftung, America Achieves and the Joachim Herz Stiftung. PISA4U's associates are the Northwest Evaluation Association, the National Board for Professional Teaching Standards, Teach For All and Edmodo.

The PISA4U programme was developed by CANDENA GmbH in association with the OECD.

The authors would like to thank Martina Bobulová and Alexander Jahn for their extensive support with the writing and editing of this report. Thanks are also due to Peter Adams, Joanne Caddy, Chi Sum (Mic) Tse, Tanja Bastianic and Audrey Poupon of the PISA for Schools team at the OECD Directorate for Education and Skills for their comments on an earlier draft.

ABSTRACT

PISA4U is an online programme developed by CANDENA in association with the Organisation for Economic Co-Operation and Development (OECD) which brings together teachers from around the world in order to learn from one another and develop meaningful, tangible improvements in their schools. This work is supported by an online collaborative learning environment that contributes to the strengthening of these strategic developments across borders and educational silos by providing participants with foundational guidance, inspiration, and support. The programme is based on an innovative collaborative learning format built upon the principles of teamwork, peer-to-peer feedback and exchange, project-based learning, mentorship, and expert input.

The pilot edition of the PISA4U programme conducted in 2017 has resulted in the development of a passionate global community of educators working together to produce innovative ideas and to bring them into their own classrooms. While originally conceived for 2 000 participants, PISA4U has attracted more than 6 000 registered participants from 172 countries and school systems.

Overall, the PISA4U pilot programme has shown that educators around the world are in need of connection with, and support from, one another. They are motivated to address the challenges they face in their profession, eager to collaborate and share knowledge with one another, and determined to develop tangible solutions for change. As a result of the programme, participants created over 100 innovative teaching resources which are now available within the PISA4U global library of teaching resources and can be accessed by teachers and educators from around the world free of charge.

RÉSUMÉ

PISA4U est un programme en ligne développé par CANDENA en collaboration avec l'Organisation pour la coopération et le développement économique (OCDE) qui rassemble des enseignants du monde entier afin d'apprendre les uns des autres et de développer des améliorations significatives et tangibles dans leurs établissements. Ce travail est soutenu par un environnement d'apprentissage collaboratif en ligne qui contribue au renforcement de ces développements stratégiques à travers les frontières et des silos éducatifs en fournissant aux participants des conseils fondamentaux, de l'inspiration et du soutien. Le programme repose sur un format novateur d'apprentissage collaboratif fondé sur les principes du travail d'équipe, de la rétroaction et de l'échange entre pairs, de l'apprentissage par projet, du mentorat et de l'apport d'experts.

L'édition pilote du programme PISA4U, menée en 2017 a débouché sur le développement d'une communauté mondiale passionnée d'éducateurs qui travaillent ensemble pour produire des idées novatrices et les intégrer dans leurs propres salles de classe. Conçu à l'origine pour 2 000 participants, PISA4U a attiré plus de 6 000 participants inscrits de 172 pays et systèmes scolaires.

Le programme pilote PISA4U a montré que les éducateurs du monde entier ont le besoin de se connecter et soutenir les uns les autres. Ils sont motivés pour relever les défis auxquels ils sont confrontés dans leur profession, désireux de collaborer et de partager leurs connaissances, et déterminés à développer des solutions tangibles pour le changement. Grâce au programme, les participants ont créé plus de 100 ressources pédagogiques innovantes qui sont maintenant disponibles dans la bibliothèque de ressources pédagogiques PISA4U que les enseignants et les éducateurs du monde entier peuvent accéder gratuitement.

TABLE OF CONTENTS

ACKNOWLEDGEMENT	3
ABSTRACT	4
RÉSUMÉ	5
1. Introduction	7
2. The PISA4U Pilot Programme	9
3. Observations from the pilot edition of PISA4U	12
4. Conclusions and outlook	20
ANNEX A. SELECTED PARTICIPANT WORK	21
REFERENCES	23

Tables

Table 1. A breakdown of registered participants in the PISA4U pilot programme by reported role in education.	14
Table 2. The top 10 countries represented among registered participants in the PISA4U pilot programme.	14

Figures

Figure 1. The assignment structure of the PISA4U pilot programme, operated in phases.....	11
Figure 2. A breakdown of female and male registered participants in the PISA4U pilot programme..	14
Figure 3. The PISA4U community, displaying a diverse range of submissions, teams, participants, and supporters.	16

1. Introduction

PISA4U is a unique online learning programme which provides a space for educators around the world to connect over the goal of developing meaningful and relevant solutions to challenges in education, to learn from and with each other about best practices, and to develop a crowdsourced repository of teaching resources and solutions that can help teachers facilitate practical changes in their classrooms. The programme was created to fill the need for connection and collaboration between educators working on school quality issues from the bottom up and addressing gaps in student performance around the globe today.

The pilot programme of PISA4U was available free of charge to educational practitioners of all types, such as teachers, administrators, education policy actors, and education researchers. This learning community consisted of two groups: education practitioners from any school or teaching organisation, and practitioners whose schools have taken the PISA-based Test for Schools.

The programme is based on an innovative collaborative learning format built upon the principles of teamwork, peer-to-peer feedback and exchange, project-based learning, mentorship, and expert input. On this backdrop, a series of carefully calibrated assignments guide teams of participants through the process of collaboratively designing solutions and teaching resources that address their specific needs. Each team's developed resource is added to a repository open to educators worldwide, thus providing value to the teaching community at large.

PISA4U was publicly announced alongside the PISA 2015 results launch events in Paris and Brussels on 6 December, 2016 in partnership with William and Flora Hewlett Foundation, Deutsche Telekom Stiftung, America Achieves, Northwest Evaluation Association, Teach For All, the National Board for Professional Teaching Standards, and Edmodo, and opened for registration at www.pisa4u.org. It actively commenced on 16 March, 2017 and the pilot programme completed on 14 August, 2017.

The PISA4U programme has been developed and produced by CANDENA in association with the Organisation for Economic Co-operation and Development.

CANDENA is a provider of full-service solutions for collaborative online learning. CANDENA's service portfolio includes programme conceptualisation, production of multimedia educational content and video case studies, programme communication, associated marketing, and mentoring and tutoring of online communities. Based on its awarded online platform, CANDENA provides integrated project management, platform operation and proprietary white label solutions for collaborative learning formats.

The Organisation for Economic Co-operation and Development (OECD) provides a unique forum where governments work together to address the economic, social and environmental challenges of globalisation. The OECD is also at the forefront of efforts to understand and to help governments respond to new developments and concerns, such as corporate governance, the information economy and the challenges of an ageing

population. The organisation provides a setting where governments from the 35 Member countries and a growing number of non-Member countries can compare policy experiences, seek answers to common problems, identify good practice and work to co-ordinate domestic and international policies.

2. The PISA4U Pilot Programme

2.1. Objective

Since 2000, the PISA survey has helped collect valuable information on student knowledge and skills, and benchmark school systems in over 80 economies around the world. By collecting advanced data on such a large scale and uncovering nuanced understandings about education systems through advanced analysis, the PISA survey supports education policy decision making on a governmental level.

Today, PISA is unprecedented in terms of the scale and depth of information it has gathered on education systems and student performance around the world. At the same time, technological advancement brings new opportunities for effectively distributing valuable information and sharing knowledge and experience, while educators worldwide are looking for ways to connect with each other. Pairing these, the project of PISA4U creates an additional avenue for supporting meaningful and effective change in education by empowering teachers to engage with the challenges they face in their own classrooms within a structured environment and with the support of their global peers and experts in education.

Thus, the PISA4U programme was developed both to address a need for teacher empowerment and to support a bottom-up approach to improvement in education that engages teacher professional development, facilitates student learning and learning environments around the world.

The pilot programme of PISA4U focused on leveraging the collective experience and knowledge of a global community of educational professionals by guiding them through a cyclical online learning and solution design process. During the programme, participants worked in teams to identify challenges, develop capabilities to design goal-oriented solutions and produce resources that can help other teachers solve similar challenges. In particular, PISA4U allowed participants to:

- Learn from the best practices and expertise of a global network of innovative education professionals and didactic experts;
- Collaborate in an international team with peers, share their knowledge and experiences, and engage in feedback exchange within the global learning community;
- Identify specific areas for innovation in their classroom and across their school system to ensure students are being prepared for 21st century careers;
- Develop the skills to expertly leverage OECD's PISA data to build a more equitable learning environment in their school;
- Simultaneously benefit from a global repository of teaching resources and solutions to real problems in classrooms around the world, but also to contribute to it, thereby providing immense value for others.

With the goal of making PISA4U learning resources accessible to educators around the world, all teaching and training material published on the PISA4U online platform is published under the Creative Commons License “BY-NC-ND” Version 4.0, and programme participants’ contributions (e.g. submissions, drafts, working papers, teaching resources) are published under the Creative Commons License “BY” Version 4.0 (see creativecommons.org/licenses/by/4.0/).

2.2. eDIDACTIC Methodology

At the core of the PISA4U programme is a unique collaborative learning system engineered to provide a vibrant environment where educators can connect with one another and make use of data from PISA and the PISA-based Test for Schools. Its didactic approach is grounded on five pillars: (1) Online Teamwork, (2) Peer-To-Peer Learning, (3) Mentoring, (4) Project-based Learning and (5) Expert Input.

2.2.1. Online teamwork

Individual members of the learning community are matched together into teams to approach challenges collectively. This team-based process allows participants to initiate and develop strong networks, as collaboration becomes integral to each team's success. Moreover, collaboration and communication not only take place between team members, but feedback exchange on multiple levels and rich forum discussions ensure that they also take place among teams, and between teams and the rest of the learning community.

2.2.2. Peer-to-peer learning

A set of feedback loops drive the interaction between programme peers on different levels, guiding them through a process of knowledge exchange where each member benefits from the experience and ideas of the community, on the foundations of peer accountability.

2.2.3. Mentorship

The programme enables personal interaction between participants and mentors. The mentors provide assistance to the community on a one-to-one or team basis, as well as one-to-many through a community forum. Mentors also evaluate participants’ work which creates a stimulating learning environment and increases the effectiveness of digital learning.

2.2.4. Project-based learning

Learning is embedded in a real-world context as teams are presented with a series of successive assignments which the teams are asked to solve collaboratively. Relevant, real-world case studies provide insights on international best practices.

2.2.5. Expert input

Experts (‘keynote speakers’) inspire the learning community with their expertise and insights on the programme topics in the form of short, informative video messages. These keynote speakers, drawn from the OECD Directorate for Education and Skills and other institutions, provide a broad spectrum of inspiration and conceptual grounding, helping the community to open their mind to new approaches. Experts also engage in forum discussions.

2.3. Programme structure

Participants of the PISA4U pilot programme worked through a sequence of five assignments collaboratively in a team, with ongoing input from the global programme community and their mentors. Teams leveraged this collaboration throughout the programme while working on the real-world challenge that they had chosen and learning from exemplary schools and speakers, as well as their own peers.

The learning journey proceeded as follows:

- At the start of the programme, participants were matched into teams of six based on their common areas of interest and other heterogeneous characteristics and set out to work through the programme collaboratively with their team members on the assignments.
- Each assignment had to be completed within a set deadline and submitted to the PISA4U community and their mentor.
- Participants' learning was supported by a library of resources, including relevant, real-world case study videos and expert interviews developed specifically for the PISA4U programme.
- Teams were guided through the collaborative process of problem solving by gradually building up skills and competencies while working through the process of developing meaningful and actionable solutions that they can use to make an impact in their respective school environments.
- After the initial period of working through the solution design process, subsequent teams consisting of existing and newly registered participants can benefit from the database of solutions and teaching resources as input for further learning.

Figure 1. The assignment structure of the PISA4U pilot programme, operated in phases

Opening Phase	A1	A2	A3	A4	A5	Evaluation Period
Mar 16 – 23	Mar 23 – Apr 13	Apr 13 – May 4	May 4 – 25	May 25 – Jun 8	Jun 8 – 29	June 29 – July 21
Getting Ready	Assignment: Identify your Challenge	Assignment: Understand the Problem	Assignment: Design a Teaching Resource	Assignment: Put your Resource to the Test	Assignment: Finalize your Resource	Participant Evaluation Period

Source: PISA4U project timeline

3. Observations from the pilot edition of PISA4U

The observations that follow have been drawn based on findings from both quantitative and qualitative participant surveys and individual participant feedback conversations conducted throughout April and June 2017, and have been enhanced using additional statistical data generated by the PISA4U platform.

3.1. Methods of data collection and analysis

During the pilot programme, quantitative data was generated both via participant surveys, conducted at specific performance milestones throughout the programme and via the platform statistics and interaction tracking data collected on an ongoing basis. This data allowed for the evaluation of initial and ongoing programme performance by means of primary performance indicators such as the development of the number of participants, retention rate, number of user generated drafts produced, final submission rate and user satisfaction.

Furthermore, qualitative data was generated to gauge programme performance on an even deeper level based on one-to-one interaction. This information was collected through ongoing direct exchange with participants, fostered by the close participant-mentor relationship. In particular, mentors conducted interviews with participants. This qualitative feedback gathering opportunity allowed context-rich, specific information about the impact of the programme on each participant.

Both types of data, quantitative and qualitative, were used to continuously reflect upon and make informed improvements to the programme on the level of teaching materials and approaches, learning environment, communication and interaction logics, and user support.

3.1.1. Data Analytics

Anonymised telemetric data was automatically collected on the learning platform through the duration of the programme. Empirical evaluation of the data was performed continuously to gain better insights on high-level usage patterns, as well as selected usability experiments, all with the aim of eliminating any future user experience friction related to the use of the learning environment.

3.1.2. Surveys

During the PISA4U pilot programme a combination of quantitative and qualitative survey research methods were used to gain a deeper understanding of participants' learning experiences. The surveys were each open over a 3-week period and received 212 anonymous responses from participants in total. Participants were asked to report on programme quality drivers such as their experiences with programme communication and the learning environment, teamwork and collaboration with other teams in the programme, working with their mentor and their experiences with the teaching materials

and programme eDidactic methodology. Participants were asked for information using multiple choice questions and ordinal data based on a 10 point Likert scale where necessary.

3.1.3. Individual Feedback Interviews

a. Participant Experience Surveys:

In order to gain a richer insight and understanding of the quantitative data, randomly selected participants were asked to answer probing, open-ended questions designed to explore their experiences with, and perspectives on, the programme with their mentors via 1:1 communication over the PISA4U platform. During programme phases 4, 5 and 6, participants shared their personal views in written form. All responses were recorded, analysed and synthesised.

b. Participant Feedback Conversations:

In addition, feedback about participants' experience within the programme was solicited via online video conversations during phase 4 of the programme. Participants were offered the opportunity to discuss their experiences in the programme with their mentor via online interviews. Notes about all conversations were recorded and analysed.

3.2. The PISA4U community: facts and statistics

In the PISA4U pilot programme, the majority of participants were education professionals who reported demanding schedules in their work life that create significant time restrictions¹. Typically, participants could be characterised as spending most of their working time focused on individual pupils and classroom management, as well as on a variety of extracurricular responsibilities related to their students. An online programme for this community therefore needed to provide a high level of flexibility, yet also required programme participants to show a willingness to take up an active, collaborative participation in the programme.

The PISA4U pilot programme has driven considerable interest from education professionals around the world. While originally conceived for 2 000 participants, PISA4U attracted more than three times this amount of users, reaching more than 6 000 registered participants. Out of this group 1,500 registered participants chose to actively form groups and engage in teamwork.

PISA4U consists not only of teachers and teachers-in-training but has also generated interest from school managers and administrators, government and policy advisors, parents, students and other interested parties. Within the programme, 90% of registered participants identify themselves as teachers or teachers-in-training. Another 8% of participants are school managers or administrators. The PISA4U pilot programme has attracted individuals in all stages of their lives and careers, with ages of participants ranging from 13 to 80 years.

¹ OECD data supports this finding, as teaching hours alone (the number of hours spent teaching a group or class of students) in primary and secondary education average at about 680 per year in OECD countries, with highs of over 1 000 teaching hours per year in some countries.

Table 1. A breakdown of registered participants in the PISA4U pilot programme by reported role in education.

# Users	Who are you?
81%	I'm a Teacher
8%	I'm a School Manager or Administrator
4%	I'm training to become a Teacher
3%	I'm simply interested
2%	I'm a Government Official or Policy Advisor
1%	I'm a Student
1%	I'm a Parent

Source: Data collected on PISA4U platform

The PISA4U community consists of 67% female and 33% male participants. In comparison to the world ratio of female-male teachers in primary and secondary education worldwide, the pilot PISA4U programme was attended by a slightly higher number of female education professionals.²

Figure 2. A breakdown of female and male registered participants in the PISA4U pilot programme.

Members of the PISA4U community come from 172 countries, producing a diverse and global community. This not only creates value for participants, but likewise allows for a broad extension of the reach of the work of PISA. The top ten countries represented in the PISA4U community are Romania, the United States, the Philippines, India, Pakistan, Nigeria, Mexico, Brazil, Italy and Portugal.

Table 2. The top 10 countries represented among registered participants in the PISA4U pilot programme.

# Users	Country
416	Romania
346	United States
334	Philippines

² According to 2014 World Bank statistics, the world percentage of female teachers in primary education is 63.5%, and in secondary education is 53%, which brings an average of 58% female teachers.

294	India
161	Pakistan
159	Nigeria
156	Mexico
138	Brazil
109	Italy
106	Portugal

Source: Data collected on PISA4U platform

3.3. Participant Motivation and Programme Value

According to the survey conducted by PISA4U, members of the PISA4U community rated the value of the programme at about 8 out of 10 on average, with over 86% of respondents reporting that they find the programme highly valuable.

Nearly all respondents reported that their motivations to register for the programme included the opportunity to learn and develop professionally, and over half of them additionally reported that meeting other educators was a strong motivating factor in their decision to join the programme. 40% of respondents reported that one of their motivations was to earn a certificate, 30% wanted to use the opportunity to solve a specific problem they have, and 30% also reported that they sought mentorship.

Additionally, when asked what they hope to gain out of participating in the programme, 65% of respondents reported that they want to learn more about the topics they care about in education, 60% reported that they hope to come out with a solution that could help them in their school environment, and over 50% reported that they hope to gain a deeper understanding of how to deal with issues in their school so that they can bring a positive difference. When asked about individual components of the programme, respondents reported that the areas of the programme which have been the most valuable for them have been the community network of educators, the case study and expert videos and the feedback they received from their peers and mentors.

These results indicate that many participants in the PISA4U pilot programme might not be able to find other avenues for practical teacher development in their everyday environments.

Figure 3. The PISA4U community, displaying a diverse range of submissions, teams, participants, and supporters.

Source: Screenshot of [PISA4U platform](#)

3.4. Collaboration, peer feedback, and mentorship

During the 6 phases of the PISA4U pilot programme, participants collaborated to generate 360 topics for discussion in the forum via 4 300 posts and exchanged 38 500 comments and messages across teams and user roles via the learning platform. On average, each submission in each phase received approximately 6 comments from other peers participating in the programme.

In the discussion forum, participants exchanged their experiences and advice on a range of different education-related topics including lesson planning tips and resources to foster student motivation and engagement, strategies and tips regarding keeping the discipline in the classroom and the positive and negative aspects of giving homework to students. Participants' observations and views on PISA4U library resources were also regularly discussed in each phase of the programme.

Further, almost 85% of survey respondents reported that they received feedback on their work from others in the community, and over 70% of these respondents reported that they found the feedback they received from the PISA4U community valuable for their work. Likewise, over 60% of respondents rated the interaction they have with their mentor as very valuable (8 or higher on a scale of 10), with an average of 7.5 out of 10 rating across all respondents. These results indicate that during the pilot programme the PISA4U learning community engaged in vibrant and valuable knowledge and experience sharing. Further, they show that a mentor's guidance and input adds significant value to participants' learning experiences as reported by programme participants.

Particularly encouraging is that, while more than half of PISA4U survey respondents reported that they usually carry out their work independently in their daily working environments and thus did not have much experience with collaborating in teams before

PISA4U, approximately 85% of respondents stated that they find it helpful to collaborate with others on solving the issues they face in today's working environments. The same percentage of participants also reported that they believe that being able to work as a part of a team with others who come from different backgrounds is valuable for their personal development. Though teaching is a profession typically performed independently, teachers welcome collaboration and view working with others as enriching, useful and valuable for their professional as well as personal development.

3.5. Community-produced results

The PISA4U programme aims to gain an understanding of the challenges that educators face in their daily work, as identified by them. In particular, it aims to detect if these challenges carry similarities for educators from vastly different countries and communities. In order to learn about and solve these specific challenges, the PISA4U pilot programme asked teams to identify and articulate the challenges they encounter in their local school education environments. Despite the vast diversity in educational contexts represented in the programme, the challenges that the teams of teachers in PISA4U reported on are focused on one of the following five areas:

3.5.1. Student Motivation

Teachers feel that there is a gap between theory and practice in school, leading to a lack of student motivation. To improve this, teachers are seeking new approaches to teaching that engage their students as self-motivated learners moving towards real-world goals.

3.5.2. Classroom Management/Disciplinary Issues

Teachers report that a range of difficulties in student discipline and classroom order tend to be accentuated by large class sizes and one-size-fits-all teaching methods. A significant question for teachers today is how to appropriately manage large classrooms and attend to students with different levels of knowledge and special needs.

3.5.3. Parental Involvement

An important challenge for teachers is engaging parents in students' education, and fostering more effective communication between parents and teachers in order to support students.

3.5.4. Bringing 21st Century Skills into School Curriculum

Teachers meet resistance in bringing 21st century skills into curriculum due to lack of support, resources and access to in-depth training on new methodologies and technologies.

3.5.5. Integrating Technology into Education

Teachers are struggling with the task of implementing new online tools and education technology in ways which aid and foster learning.

Within these categories of challenges, the majority of teams worked on developing teaching guides and manuals designed to help other educators in their classrooms. These included a variety of suggestions and tips on topics such as increasing student engagement, or new ways to foster certain skillsets. Some unique solutions have been

developed on top of existing teaching strategies, such as differentiated instruction, project-based learning, or online education.

Some projects address larger school administrative challenges and curriculum changes. These teams worked on strategic plans that take longer to implement, but will potentially offer a substantial impact on their students, schools and communities. A number of teams focused on Science, Technology, Engineering and Mathematics (STEM) education, for instance, and developed action plans to improve existing math and science curriculums to cultivate industry-related skills in the classroom.

Over 100 solutions to different challenges in education were presented by teams at the end of the programme. Examples of this work can be found in Annex A: Examples of Participant Work at the end of this report and online at: www.pisa4u.org.

3.6. Key findings

The PISA4U programme was developed to provide a constructive outlet for educators to voice their opinions, work on feasible solutions to the everyday challenges they face, and create a space where they can pursue meaningful connections with others who are able to empathise with their experiences. Teachers from a variety of backgrounds working in a broad range of educational institutions around the world such as kindergartens, primary and secondary schools, and universities, as well as in informal settings such as refugee camps, joined the PISA4U programme to learn, collaborate and find solutions together in order to make a positive difference in their local environments.

The opportunity to be part of an online community of educators enabled participants to benefit from rich advice, feedback and experience exchange. Moreover, it fostered a sense of global community and solidarity among participants. Throughout the programme, participants have stated that PISA4U provides them with additional benefits that are not offered by their local education institutions, such as international collaboration, specialised guidance from an international community and an impartial, experienced mentor, unique expert resources, and the opportunity to engage in accessible, supported, and self-directed professional learning. Many reported appreciation of the collaborative, project-based didactic approach the PISA4U programme facilitated.

Overall, five main take-always can be discerned:

3.6.1. There is significant demand for professional development opportunities for educators.

The PISA4U pilot programme has shown that there is significant demand among education professionals for opportunities to develop their skills in teaching, curriculum design and school leadership. Most participants in the PISA4U pilot programme expressed a keen interest in learning about innovative practices that are helping to improve schools around the world. Participants stated that this programme allowed them to learn from global experts, international best practices and from peers who share the same problems as them.

3.6.2. There is significant demand for connection, networking and co-creation among teachers internationally.

The PISA4U community has eagerly taken up the opportunity to connect digitally across countries and across school systems in the pilot programme. The high level of exchange

seen within the community signals a particular need for connection and knowledge-exchange among teachers internationally. Teachers are not only interested in the work of their colleagues around the world, but are able to find the necessary inspiration, empathy and support in them as well.

3.6.3. Teacher development opportunities are not equally distributed among economies.

While demand for the PISA4U programme came from various economies around the world, the demand was higher in developing economies, especially when accounting for the size of the teacher population in these countries. This may indicate a lack of professional development opportunities in these countries when compared to their more developed counterparts.

3.6.4. There is significant contrast between the challenges faced by teachers in developed versus developing countries.

Challenges brought forward in the programme differed by teachers from developed and developing countries. These differences are reflected in the approaches the teachers tend to take to working in the programme, their ability to follow the project-based didactic approach of the programme and the goals they followed. While those in developed countries strive to increase motivation by deploying different teaching strategies, for example cooperative learning, installing growth mindset, or integrating the appropriate technology in one's teaching process, teachers in developing countries struggle with heavily overcrowded classrooms, inclusion of children with special needs, lack of teaching resources entirely (e.g. in refugee camps), especially in the native language (e.g. in countries such as the Philippines and Indonesia), or a lack of parental engagement to the extent of delegating parental duties to teachers (e.g. in Kenya).

3.6.5. A significant portion of teachers would benefit from enhanced digital skills.

Lack of digital skills was a source of difficulty identified by PISA4U participants. Teaching as a profession is not yet intrinsically related to technology use. While many teachers are often exposed to use of common technology such as email and social networks, they are not necessarily fully fluent in making effective use of online tools and applications in order to learn, work and collaborate. Therefore, this type of working and collaborating in an online environment did not come naturally to some participants, especially at the beginning of the programme.

Within the first few weeks, with the support of their mentors, participants who lacked digital skills learned how to effectively use the learning platform in line with the programme requirements, including those accessing the platform from their mobile devices.

4. Conclusions and outlook

Experiences in the PISA4U programme show that an online, solution-oriented and project-based approach to solving challenges in schools enables tangible and implementable solutions to be produced by those who are affected by them most. It can be observed that educators are eager to partake in this type of community, interested in collaboration and able to deliver unique and meaningful results in response to the challenges they encounter.

Throughout the programme, the opportunity to be part of an online community of educators has enabled participants to benefit from valuable advice, feedback and experience exchange, and has fostered a sense of global community and solidarity among participants. A global community and learning environment such as the one developed in the PISA4U programme is not easily provided by education institutions locally, and thus has been reported by participants as a valuable source of connection, guidance and practical development.

Online collaborative formats that allow for community development, knowledge sharing and support in an accessible and international context should be considered and developed in education both to improve teaching practices and creatively meet the problems that schools and teachers are dealing with in the 21st century. Online collaborative formats can be helpful for facilitating specific information and data exchange between education professionals, and connecting students in a structured environment that allows them to lend support across regions and become empowered learners.

Moving forward, PISA4U is dedicated to playing a key role in this work by helping bridge the gap between differing knowledge and experience levels of teachers globally to empower teachers to become educational leaders in their classrooms and schools around the world, and to allow them to develop and foster systemic changes in education systems from the ground up.

ANNEX A. SELECTED PARTICIPANT WORK

TEAM BRIDGE BUILDERS

Team Bridge Builders was formed by teachers from Colombia, the Dominican Republic, and the United States who teach Science, Social Studies, English and Art to studies in Grades 6 to 11.

Addressing their chosen challenge of low student motivation, Team Bridge Builders developed the resource “*The Bridge Builder’s Toolkit: Increasing Student Motivation Through Community Building*”. The toolkit includes an explanation of the Bridge Builder’s community building framework, sample activities and challenges for students, resources for implementing the framework and motivational posters for classrooms.

The toolkit focuses on assisting teachers in increasing student motivation by providing a methodology which helps establish a positive classroom community and encourage student collaboration while helping students sharpen their problem solving and critical thinking skills. The toolkit also includes practical information for teachers on how to implement and modify activities in the toolkit to suit various classrooms.

TEAM PISA4U#GLNCHALLENGE

Team PISA4U#GLNChallenge was formed by six teachers from Australia, Belgium, Romania, the United Kingdom, and the United States who teach subjects ranging from biology to engineering and mathematics.

The team worked on the challenge of innovating how STEM curriculum is taught in the 21st century. This challenge was developed by the Global Learning Network (GLN) and taken on by select teams in the PISA4U programme.

In response to this challenge, Team PISA4U#GLNChallenge developed “*The STEM Resource Portfolio: The ideal assistant of Math, Science, and Engineering teachers*”, a set of 40 lesson plans on math, science and engineering that are easy for teachers to integrate into their classrooms.

The portfolio is targeted towards middle and high school teachers of math, science, and engineering, and aims to inspire teachers to incorporate STEM subjects, particularly math, into other subjects taught in schools, helping students develop a deeper understanding of STEM subjects and encouraging critical thinking. The portfolio also guides teachers in the process of integrate technology into the learning process.

REFERENCES

- Candena (2017), *PISA4U*, <https://www.pisa4u.org/>. [3]
- OECD (2016), *Trends Shaping Education 2016*, OECD Publishing, Paris, http://dx.doi.org/10.1787/trends_edu-2016-en. [7]
- OECD (2017), *PISA 2015 Assessment and Analytical Framework: Science, Reading, Mathematics, Financial Literacy and Collaborative Problem Solving*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/978264281820-en>. [11]
- OECD (2017), *Education at a Glance*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/eag-2017-en>. [2]
- OECD (2017), *OECD Handbook for Internationally Comparative Education Statistics: Concepts, Standards, Definitions and Classifications*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264279889-en>. [4]
- OECD (2017), *Schools at the Crossroads of Innovation in Cities and Regions*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264282766-en>. [5]
- OECD (2018), *Teaching hours* (indicator), <http://dx.doi.org/10.1787/af23ce9b-en>. [6]
(accessed on 23 March 2018)