

University Accountability Agreement (UAA)
Institution-specific Key Performance Indicators (KPIs) (as at June 2019)
The Hong Kong Polytechnic University (PolyU)

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PolyU: Performance review by domain and supplementary tables

The following sections provide a summary of the performance of PolyU institutional-specific KPIs in each of the five domains of the UAA. Many of the sector-wide performance measures institutional-specific KPIs are already regularly tracked within the University for the purposes of understanding progress and seeking opportunities for continuous improvement.

Domain 1: The quality of the student experience of teaching and learning

A common indication of student achievement is the starting salary or income of graduates. In 2017/18 the average annual salary of graduates in full-time employment (including commission) was over \$236,000, representing an increase of 1.9% over the previous year. The average annual income of PolyU graduates has remained close to the sector average in the past three years.

Service-learning is a key pillar of the undergraduate curriculum in our endeavour to develop graduates into responsible global citizens. At PolyU service-learning is defined as an experiential learning pedagogy that integrates meaningful community service with academic study and reflections to enrich students learning experiences. All undergraduate students are required to successfully complete a three-credit subject on service-learning. PolyU is the first university in Hong Kong to make service-learning mandatory for all undergraduate degree students. The number of students enrolled in service learning remains stable at approximately one quarter of undergraduate students in every cohort. In 2017/18, 3,733 students enrolled in a service-learning subject. While most service learning is conducted locally, growth of non-local service learning is encouraging and comprises 28.4% of opportunities in 2017/18 academic year.

PolyU strives to enrich the learning experience by encouraging active learning via the use of innovative teaching approaches and technology. Blended learning brings the best of both classroom and e-learning together, and PolyU is taking a phased approach to blended learning adoption by commencing with subjects offered to large classes (200 or more students enrolled). Currently, around two-thirds (71%) of such subjects in the University utilise technology-enhanced active learning for more than 30% of class time.

Teaching excellence is integral to the student experience and PolyU's dedication to teaching is demonstrated with the attainment of three UGC awards from 2015/16 to 2017/18, representing one of the highest achievements among sister institutions. The number of UGC-funded teaching and learning related proposals for the 2016-19 triennium is one of the highest in the sector at 8 projects (valued at HK\$93.8 million) in the role of leading university.

Table 1: Domain 1 - The quality of the student experience of teaching and learning

KPI Name and Description	2015/16	2016/17	2017/18
KPI 1 Average Annual income of fresh graduates			
Average annual salary (HK\$) of full-time graduates in full-time employment (including commission).	\$224,429	\$231,996	\$236,381
KPI 2 Percentage of students enrolled in service-learning subjects			
This KPI refers to the percentage of students (FYFD and SY) enrolled in service-learning subjects.	26.00%	26.50%	25.30%
KPI 3 Percentage of subjects adopting blended learning / flipped classroom approaches			
The number of subjects comprised of technology-enhanced active learning for more than 30% of class time as a proportion of all subjects offered. Measured in phases according to the blended learning adoption across the University with initial phase targeted at large classes (subjects of 200 or more students enrolled).	-Not Available-	57.10%	70.97%
Number of UGC teaching awards in 2015/16 - 2017/18 : 3 awards			
KPI 4 Teaching grants received in 2016-19 triennium : HK\$93.8 million			

Domain 2: The quality of Research Performance and of Research Postgraduate Experience

PolyU continually tracks the impact and quality of research output. Counted on a 5-year average (2013 – 2017 inclusive) basis, data from Scopus journal publications only (excluding self-citations) produced by PolyU, yields a citations per output of 12.3. Of those publications, 46.9% are in the top 10% journal percentiles as measured by CiteScore. CiteScore is a journal metric used in Scopus, calculating the average number of citations received in a calendar year by all items published in that journal in the preceding three years.

Currently, 11.3% of ongoing research projects are interdisciplinary in nature and involve international collaboration. Looking ahead, PolyU strives to elevate the performance of these research metrics in light of recent increased investment in research infrastructure and talent to fortify pockets of research excellence.

PolyU strives to deliver a diversified research postgraduate (RPg) programme to provide students with a distinctive, research-led education that empowers all to develop their full potential. Cultivating an active research culture among the research postgraduate students is an essential part of the research postgraduate experience. Research postgraduates are encouraged to disseminate research findings and publish in quality journals and proceedings. In 2017/18, of the 1,920 research outputs produced by our research postgraduate students, over one-third are published in the Top 10% cited Scopus journals and conference proceedings.

Our research and academic reputation is recognised as measured by our attainment in the subject rankings of international league tables. In the 2018 QS subject rankings, the University was in the Top 50 for the following subjects:

- Hospitality and leisure management (#3)
- Civil and structural engineering (#10)
- Architecture/ Built environment (#19)
- Art and design (#24)
- Nursing (#35)
- Business (#39)
- Linguistics (#40)
- Accounting (#47)
- Social Sciences & Management (#48)

Table 2: Domain 2 - The quality of research performance and of research postgraduate experience

KPI Name and Description		2011-2015	2013 - 2017
KPI 1(a)	Citations per output		
Citation count on a 5-year average / Total no. of publications. Both citations and output metrics as extracted from SciVal, which takes data from Scopus. (self-citations excluded)		18.6	12.3
KPI 1(b)	Percentage of output in top journal percentiles		
Proportion of research output published top 10% Scopus journals based on CiteScore.		43.3% (Journal articles only)	46.9% (Journal articles only)
		39.2% (all publication types)	43.5% (all publication types)

KPI Name and Description		2015/16	2016/17	2017/18
KPI 2	Number of world leading disciplines ranked Top 50 in the QS subject ranking			
Number of subjects ranked within the top 50 of latest QS subject ranking.		8 subjects	8 subjects	9 subjects
KPI 3	Percentage of non-local interdisciplinary research projects			
Percentage of ongoing interdisciplinary projects involving international collaboration.		-Not Available-	-Not Available-	11.30%
KPI 4	Percentage of Research Postgraduate students published in Top 10% cited Scopus journals and conference proceedings			
Proportion of research output produced by RPg students published in top 10% Scopus journals based on Citescore as a percentage of all research output produced by RPg students.		25.80%	25.78%	30.94%

Domain 3: Knowledge transfer and wider engagement

Knowledge transfer, entrepreneurship and community engagement are core strategic components supporting education and research. Translation of innovation and insights into impact on business and the wider community are a core part of the focus on creating advancements that will better the world and benefit mankind. Underpinned by solid scholarly research, below are some examples of the application of research innovations.

KT Case 1: WiseEye: AI-based Textile Material Inspection System

Fabric inspection is essential for identifying defects and ensuring the quality of fabrics and textile along the textile manufacturing value chain. Most textile and apparel manufacturing enterprises still rely on manual visual inspection, which may result in unreliable and inconsistent inspection results due to human errors. Although there are a few automatic fabric inspection systems on the market, they fall short of industry requirements for inspecting different weaving structures and fabric colours.

The research team led by Professor Calvin Wong, Institute of Textiles and Clothing, developed an automatic fabric defect detection system named “WiseEye”, which comprises of specially designed hardware and software with advanced AI algorithms.

WiseEye incorporates a high-power LED lighting module and a high-resolution camera which are driven by a motorized rail to capture images covering the whole width of woven fabric during the weaving process. The captured images are analyzed by AI and deep learning algorithms to detect fabric defects on a real-time basis. Based on acquired data from thousands of yards of fabrics, the WiseEye was trained to detect all 40 common fabric defects. Alert for defects will be given for on-site fabric quality control.

WiseEye has been put on trial for six months in a real manufacturing environment. Trial results showed that the system achieved high fabric defect detection accuracy of over 90%, thus reducing 90% of the loss and wastage in the manufacturing process when compared with traditional human visual inspection. In April 2019, the technology was licensed to a subsidiary of Esquel Group, one of the world’s leading textile and apparel manufacturers. The adoption of the technology by Esquel exemplifies the industrial application value of the technology.

The technology, which is expected to bring positive impact to the textile manufacturing industry, won two Grand Awards and Gold Medal with the Congratulations of Jury in the 47th International Exhibition of Inventions of Geneva in 2019.

KT Case 2: Palm-sized 3D Ultrasound Imaging System for Radiation-free Scoliosis Assessment

Scoliosis is one of the most prevalent spinal diseases affecting adolescents. It is estimated that about 3% to 5% of adolescents in Hong Kong suffer from scoliosis, with increasing prevalence in recent years. A recent study in Guangzhou indicated that for girls aged 14 and 15, the prevalence is as high as 13.8%. About 15% of the adolescents with scoliosis have deteriorating conditions, and bracing or surgery would be required when curves progress to moderate or severe status. Early detection of scoliosis conditions and regular check-up during the rapid growing period of adolescent school-children is thus crucial. At present, X-ray imaging is the clinical gold standard for scoliosis assessment, but radiation exposure may pose increased risk of cancer.

In view of the above, PolyU developed “Scolioscan Air”, a portable radiation-free ultrasound imaging system that enables more youngsters to have their scoliosis conditions detected early and monitored frequently. The first-of-its-kind palm-sized 3D ultrasound imaging system for radiation-free scoliosis assessment can bring accurate, safe, real-time feedback and cost-efficient mass screening to schools and anywhere in the community.

Developed by Ir Professor Zheng Yong-ping, Head of Department of Biomedical Engineering, Scolioscan Air weighs only 5 kg and can easily be transported anywhere to facilitate mass screening. This more advanced system was developed based on the PolyU-developed 3D ultrasound imaging technology, which operates under the trademark “Scolioscan”. Scolioscan weighs about 150 kg and was successfully commercialized into a clinic-based facility in 2016. Clinical trials of Scolioscan have proven the novel technology is very reliable, with accuracy of curve measurement comparable to X-ray assessment. The advanced palm-sized Scolioscan Air makes it readily available for commercialisation for popular use and can widely benefit society.

Scolioscan Air was recently awarded Grand Award, Gold Medal with the Congratulations of Jury, and Special Merit Award at the 47th International Exhibition of Inventions of Geneva held in April, 2019.

KT Case 3: Defocus Incorporated Multiple Segments (DIMS) Spectacle Lens for Myopia Control

Short-sightedness, also known as Myopia, is one of the most common eye disorders. Myopia is highly prevalent among populations worldwide. About 70-80% of young adults living in Eastern Asian regions have Myopia. The prevalence of myopia in Caucasian population is about 30-40% with an upward trend.

Myopia leads to blurry vision of distant objects and causes inconvenience in daily living. Severe myopia can even cause sight-threatening ocular diseases such as retinal detachment, glaucoma, and premature cataracts. While myopia can be corrected by spectacle lenses, contact lenses or surgery, early intervention to control its progression would benefit the subjects for the rest of their lives. Myopia control is currently possible through optical or pharmaceutical approaches. As the optical approach is less invasive, ophthalmic devices that can retard or stop myopia growth are desirable.

The research team led by Professor Carly Lam and Professor To Chi-ho of the School of Optometry of PolyU, together with research collaborator HOYA Corporation invented the Defocus Incorporated Multiple Segments (DIMS) Spectacle Lens, which can effectively slow down myopic progression in children. By an ingenious design of minute multiple segments within the lens area to introduce myopic defocus, the research team successfully overcame the challenge of maintaining myopic defocus in all directions of gaze for spectacle use. DIMS Lens thus provides clear vision and myopic defocus simultaneously for the wearer at all viewing distances.

The clinical trial of DIMS lens conducted from 2014 to 2017 proved its efficacy in retarding the progression of myopia by approximately 60% in a total of 160 Chinese children aged 8 to 13. About 20% of them had their myopic progression halted completely. In 2018, with its innovativeness and potential societal impact, the technology snatched the Grand Prize of the 46th International Exhibition of Inventions of Geneva.

The DIMS lens technology has been licensed to HOYA Corporation for worldwide commercialization. Since the product launch in July 2018, over 60,000 DIMS lens units have been sold in Hong Kong and Chinese mainland. The product will also be promoted in other major markets around the world, benefiting myopic children worldwide.

Appreciating the strategic importance of innovation and entrepreneurship development, PolyU has been a forerunner in offering funding and support to promote innovation and entrepreneurship among students and staff. Through a variety of different funding schemes administered by the University, as at end of 2017/18 financial year, 253 start-ups were supported in the last three years. Their survival rate is encouraging and 61% of the PolyU-supported graduate or staff start-ups formed three or more years ago are still in operation.

On a related front, the University continues to expand its efforts to develop regional partnerships with institutions and intermediaries to leverage local and regional resources to support knowledge transfer and entrepreneurship endeavours. In 2017/18, the number of partnerships supporting licensing endeavours, entrepreneurship education, seed funding and incubation efforts stands at 111, representing almost a 25% increase from the previous year.

Table 3: Domain 3 - Knowledge Transfer and wider engagement

KPI Name and Description		2016/17	2017/18
KPI 1	Knowledge transfer impact cases with economic and / or social impact Qualitative summaries of examples of KT with significant economic/social impact.		
KPI 2	Cumulative number of startup ventures created by students, graduates or staff with support from the University's seed funding and entrepreneurship programs in the last three years Number of all the startups by entrepreneurship funding schemes administered under the Institute for Entrepreneurship of PolyU, that excludes the number of same startups repeatedly supported by more than one funding schemes of the University.	219	253
KPI 3	Survival rate of startup ventures Percentage of startup ventures funded for more than 3 years still in operation.	56%	61%
KPI 4	Number of partnerships for knowledge transfer and entrepreneurship activities Community partnership for KT and entrepreneurship activities – number of companies, industry associations and government bodies/departments with partnership with PolyU.	89	111

Domain 4: Enhanced internationalisation

Enhanced internationalisation nurtures our students' international perspective so that they can develop as global citizens, and make a meaningful contribution to their community and the world.

Internationalisation of the student body remains an important priority, and diversity is attained through leveraging our strong recruitment networks in Belt and Road countries/regions. Students from Belt and Road countries/regions comprise over 90% of the non-local student body. Aside from Mainland China, a large majority of the non-local undergraduate student body come from Republic of Korea, Kazakhstan, Indonesia and Malaysia.

In addition to student diversity, PolyU has stepped up efforts in recent years to diversify the academic staff body. Up to December 2017, over 37% of the full-time academic staff body consists of individuals hired from outside of Hong Kong.

Other key facets of internationalisation include mobility and international collaboration. In 2017/18, the University continues to leverage over 360 partnerships with non-local universities and organisations to bring diversified mobility opportunities for our students, research collaboration and knowledge transfer endeavours.

Table 4: Domain 4 - Enhanced internationalisation

KPI Name and Description		2016/17	2017/18	2018/19
KPI 1	Number and percentage of non-local undergraduate student enrolment from Belt and Road countries/regions			
	Number of non-local undergraduate students from Belt and Road countries/regions.	1,401	1,356	1,624
	Percentage of non-local undergraduate students from Belt and Road countries/regions.	83.10%	81.10%	90.40%

KPI Name and Description		2016/17	2017/18
KPI 2	Percentage of full-time academic staff hired from outside Hong Kong		
	Percentage of full-time permanent and visiting staff recruited outside Hong Kong.	37.70%	37.5%
KPI 3	Number of partnerships with non-local universities and organizations for student experience, research collaboration and knowledge transfer		
	Number of partnerships with non-local universities and organizations for student experience, research collaboration and KT.	367	368

Domain 5: Financial health and institutional sustainability

To ensure financial sustainability of the institution in the longer term, the University closely monitors the following sector-wide and institution-specific key performance measures. The performance measures are prepared with reference to the data and information in the Provisional Allocation Letter for the 2019/20 to 2021/22 triennium.

To accelerate the investment in the core functions and especially to strengthen the teaching and research capability, the University will adopt a deficit budget strategy under prudent financial management for 2018/19 but to achieve a balanced budget from 2019/20 onwards to sustain financial health. At the same time, the University will continue to focus its resources on its core functions and over 70% of the University's expenditure will be allocated to teaching, learning, student and general educational services and research over the years.

The University has diversified income sources to ensure financial stability. While subventions from the UGC continues to be the major source of income for the University, the University maintains stable income from its self-financing activities and secures support from various funding bodies to maintain a balanced mix of income and bolster the strategic development of the University.

The financial position of the University is reviewed regularly to identify and manage potential risk. As reflected in the current ratio and coverage of the university's expenditure by reserves and cash equivalent, the University exercises a prudent and disciplined approach in preserving a reasonable level of reserves to cater unforeseen fluctuation of spending requirement and safeguard its financial health and sustainability.

People are a key asset and timely talent acquisition is of importance to support teaching and research needs. In 2017/18, 66% of planned Assistant Professor positions were filled within the financial year. Beyond acquisition, grooming of talent is a priority and the University provides extensive opportunities for continued professional development for both academic and non-academic staff alike. In 2017/18, 64.5% of middle-management academic and non-academic staff enrolled in both in-house and external development programmes.

Table 5: Domain 5 - Financial health and institutional sustainability

KPI Name and Description		Forecast				
		<u>2018/19</u>	<u>2019/20</u>	<u>2020/21</u>	<u>2021/22</u>	
KPI 1	Percentage of expenditure for teaching, learning, student and general educational services, research to total expenditure	Consolidated Level	72%	72%	73%	73%
		University Level	77%	76%	78%	78%

No.	KPI Name	2015/16	2016/17	2017/18
KPI 2	Percentage fulfillment of planned Assistant Professor positions			
	Number of full-time Assistant Professor positions (including Research Assistant Professor) fulfilled within the financial year.	63%	77%	66%
KPI 3	Percentage of middle-management academic and non-academic staff enrolled in training or receiving staff development support	-Not Available-	-Not Available-	64.5%