

CSC Evaluation and Monitoring Programme

Tackling Medical Waste in Nigeria and Widening Access to Tertiary Education

Babajide Milton Macaulay



Located in the western coast of Africa, Nigeria has a rapidly growing population that is currently estimated by the United Nations to be approximately 225 million and projected to reach 377 million in 2050.

Like many countries, Nigeria faces environmental problems, among them deforestation, oil spills, air and water pollution, and waste management are a few. The continued increase in the quantity and rate of solid waste generated by the growing population is outgrowing the capacity of existing facilities and infrastructure put in place to manage them. The poor management of waste and its indiscriminate disposal into ecosystems exacerbates pollution and its impacts, which continues to create a catastrophe for Nigeria's people and the environment. Consequently, urgent attention is required to develop more robust and efficient waste management systems. Moreover, creating more awareness on environmental issues through training environmental scientists and supporting researchers is crucial for the sustainable socio-economic development of Nigeria.

Babajide Milton Macaulay is a Commonwealth Alumnus who completed a Master's degree in Sustainable Environmental Management, and a PhD in Environmental Geochemistry and Geomicrobiology both through the support of Commonwealth Scholarships. He generated evidence through his research on poor waste management in healthcare facilities which led to the implementation of the Ondo State Medical Waste Management Bill that was

signed into a law by the Ondo State Governor in 2019. He has also been instrumental in addressing the urgent need to find solutions for environmental issues in Nigeria and the wider world by empowering the next generation of environmental scientists with knowledge and by contributing to the enabling systems fundamentally aiming for the prosperity of students and researchers.

Babajide has not only played a pivotal role in the introduction and development of a Master's programme at the Department of Biology in the Federal University of Technology Akure (FUTA) to train students on climate change issues and renewable energy, but also has been actively offering support to ensure that the teaching curriculum taught at his department is keeping up with the highest academic standards. Furthermore, Babajide is providing guidance and advice to students from African countries who aspire to scholarship opportunities for study abroad for further learning and development through his start-up iLLUMANIA, which was established in 2018. Moreover, in 2022 he co-founded the digital platform Wadi which has created access to resources and equipment for researchers in Africa.



Babajide Milton Macaulay was awarded a Commonwealth Scholarship in 2012 to undertake a Master's degree in Sustainable Environmental Management at the University of Greenwich, an achievement he repeated in 2015 when he was awarded a Commonwealth Scholarship to undertake a PhD in Environmental Geochemistry and Geomicrobiology at the University of Manchester. He holds a Lecturership in the Environmental Biology and Public Health Unit in the Department of Biology at the Federal University of Technology Akure (FUTA) in Nigeria. He also serves as the Chief Registration Officer of the Department and the Secretary of the Academic Board of the Department. His research collaboration with his undergraduate student on investigating medical waste management practices in 2016 led to the implementation of the Ondo State Medical Waste Management Bill which signed into a law by the Ondo State Governor in 2019. In 2018, Babajide founded iLLUMANIA, which has produced 250 scholarship winners across Africa by providing international postgraduate scholarship guidance. In 2022 he co-founded Wadi, a digital platform that connects researchers to resources to complement research and development in Africa. He recently joined the Student Entrepreneurial Committee at FUTA which aims to empower graduates to venture into entrepreneurship.

A Journey to Becoming an Academic Entrepreneur

Babajide's career in teaching and research started in 2012 after completing his first degree when he joined the Department of Biology at the Federal University of Technology Akure (FUTA) in Nigeria as a Graduate Assistant. Upon realising a gap in the teaching expertise in ecology, he decided to pursue further studies to make a meaningful contribution to teaching and research in this subject area. Having come from a humble background, he required support to fulfil his dreams, so he applied to several scholarship schemes however was successful with securing a Commonwealth Scholarship to study for a Master's degree in Sustainable Environmental Management at the University of Greenwich in 2012.



Congratulated by the Vice-chancellor of the University of Greenwich, Prof. David Maguire, for emerging as the recipient of the Best MSc Project Award on the Sustainable Environmental Management programme of the Natural Resource Institute (NRI), University of Greenwich, UK (July 2014).

'The moment I graduated from university, that was 2010, I was the best in my cohort, so my department decided to recruit me as a lecturer. I accepted the job because I love teaching and research. I was on that job for six months, and I discovered that in the Department of Biology, [they] only had one Lecturer for Ecology. And so, I had to talk to my Head of Department if I can I do something related to the environment to complement the staff in the department. This was the period where climate change took stage globally, I'm talking about 2009 to 2012. So, that also motivated me to study something that will make me relevant in the future.'

Upon completing his Master's degree in 2013, Babajide returned to his home country, and he resumed lecturing at his former employer, FUTA where he was immediately promoted to Assistant Lecturer. Having spent a year at a UK-based institution on a Commonwealth Scholarship, Babajide gained exposure to diversity, high quality educational infrastructure, and international experience along with the opportunity to acquire new knowledge and skills. Newly upskilled, he felt ready to start taking initiatives for knowledge and skills transfer. He instantaneously took up teaching environment-related courses in his department.

'My department staff were so happy because the moment I came back [from studying for a Master's degree in Sustainable Environmental Management], I was qualified to teach the environment-related courses in the department. I was also able to support the only ecologist that we had.'

In addition to teaching, Babajide also provided research support to his students. Working in collaboration with an undergraduate student, Babajide conducted research in 2016 to investigate healthcare waste disposal management practices in Nigeria. It was an exceptionally successful project sparking debate on medical waste management and eventually leading to the adoption of the Ondo State Medical Waste Management Bill, which was later signed into a regulation by the Ondo State Governor in 2019.

Driven by his impetus for professional growth and career progression, Babajide applied for a PhD study in Environmental Geochemistry and Geomicrobiology at the University of Manchester, for which he received yet another Commonwealth Scholarship to support his studies. As before, Babajide returned to the Federal University of Technology Akure upon completing his PhD studies. Having done a PhD, he was now qualified for a promotion to Lecturer. In his new role, he now teaches courses in line with his PhD study to students studying towards a Master's degree.

'The PhD degree qualified me to teach Master's students at FUTA. Therefore, I currently teach master's courses such as Ecotoxicology, Environmental Modification, Environmental Impact Assessment and Global Change Biology. And these are courses related to climate change, GHGs, so the knowledge from both my Master's and PhD come to play. This role grants me the opportunity to raise the next generation of Environmental Scientists in Nigeria.'

Over time, he subsequently rose through the ranks in seniority within his department, following his successful completion of a PhD.

‘So, after I finished my PhD, I returned to my school and I was promoted instantly to the next rank. Earning immediate promotion at work (FUTA), from Assistant Lecturer to Lecturer, as a result of my PhD degree obtained from the University of Manchester, influenced my professional growth as an academic. And I’ve improved the quality of teaching. Now, I teach Master’s courses. The way I teach the courses is so practical, and this is because I am a trained professional in the field of environment.’

Through his academic activities at FUTA, Babajide has contributed to the growth and development of the university by steadily anchoring the Environmental Sustainability courses of the Department at both the undergraduate and Master’s levels for the past four years.

‘Within this period, I taught 3,000+ undergraduate and 71 Master’s students. I also supervised the final year research projects of six undergraduates and Master’s students who produced research works focused on groundwater arsenic assessment and microplastic in drinking water sources. I leveraged technology and my PhD experience in delivering these tasks successfully. Altogether, I have contributed to improving the overall performance of our graduating students (both undergraduate and Master’s), as the number of first-class and second-class (upper division) graduates in the department has risen by 60% and 55% respectively from 2020 to date. I have also contributed to knowledge in the area of arsenic groundwater research and pioneered microplastic research in drinking water in Nigeria.’

In addition to lecturing, Babajide holds administrative roles within FUTA. He has been appointed as the Chief Registration Officer and Secretary of the Academic Board, positions that have seen him influence the strategic direction of his department and the university as a whole. He has played a pivotal role in reviewing and revising the curriculum for the Department of Biology to include modules on climate change and renewable energy, as well as in influencing the university to take up virtual learning environment following the COVID pandemic. Both of his initiatives have positively improved the overall learning experience for the students as well as access to education.

‘When we launched the Master’s programme in the department, which is tagged Environmental Biology and Public Health, in the first year we had about eight students that enrolled for the programme in 2016. Today, 2023, in my class the students are 25. This shows that there is more awareness on the importance of learning more about climate change issues, environment, global warming, and renewable energy. Because the more well-informed, well-trained environmental experts that we produce, the more that we are going to have such gaps filled in different sectors of our economy.’

Babajide has also been instrumental in introducing virtual learning through the Zoom platform following the COVID pandemic that led to the closure of the university and the discontinuation of learning as FUTA was unprepared for virtual delivery of courses.



Babajide (seated) celebrated by members of the Environmental Geochemistry research group at the University of Manchester, UK, for successfully completing his PhD degree (June 2019).

‘Because of the fact that I’ve been exposed to the way technology can be used to do a whole lot of things in Manchester, I was able to immediately advise my school to switch to a virtual platform. And that was what motivated the Vice-Chancellor to sign a deal with Zoom. So, we used Zoom from January to November 2021. I’m very happy that I was able to put out such an advice, and the management listened.’

Outside his university commitments, Babajide founded two education-focused start-ups: iLLUMANIA in 2018, a platform that provides scholarship application guidance and other academic services; and Wadi in 2022, an online platform that connects African researchers to resources such as lab equipment, learning and development opportunities, community support, and funding to drive local innovation and development in Africa. Babajide highlighted how his experiences during his Commonwealth Scholarship motivated him to establish the two start-ups to improve access to quality education and research support in Africa.



Babajide (right) presented with the Most Outstanding Start-up certificate award by Mr. Ademola Adeyemi-Bero (left) for leading the Wadi team to first place at the Technology, Entrepreneurship and Design (TED) Lab (Start-up pitch competition) at the Nigerian University of Technology and Management (NUTM) in Lagos State, Nigeria (July 2022).

‘Having won multiple international scholarships including the Commonwealth Scholarships for my Master’s and PhD degrees, I was inspired to create iLLUMANIA to help African proteges access international scholarships to fund their career dreams. Moreover, having experienced a digitalised process of accessing research equipment at the University of Manchester, I transferred a similar idea upon my return to Nigeria to resolve the problem of poor access to research equipment by creating Wadi.’

As a founder of iLLUMANIA and co-founder of Wadi start-ups, Babajide has recently joined the Student Entrepreneurial Committee at FUTA. This university-wide group encourages graduates to consider venturing into entrepreneurship, hoping that shifting how the future generations perceive the relationship between problems and solutions will lead to more dynamic economic growth and promote social change.

‘Because they [The Student Entrepreneurial Committee] found out that I just got another start-up, they felt that my expertise is going to be needed, so they added me to that committee. We can teach students how to think entrepreneurial, so that they can start thinking of how to solve societal problems and turn solutions into businesses.’

Reflecting on the impact of the Commonwealth Scholarship, Babajide identified the most significant change to himself as a result of the Commonwealth Scholarship.

The most significant change to me as a result of my scholarship is definitely the earning of my PhD degree from a top university globally. It was the vehicle for the public credibility and social trust I enjoy today. Currently, I am well-respected on a professional platform like LinkedIn, because of the perception that I am well-learned and must be a credible source of reliable information. I have leveraged this perceived status by using my platform to talk about education matters including scholarships, and this has increased my followership from 5,000 to 35,000+ within 4 years. Also, 80% of iLLUMANIA clients are from my LinkedIn page.

Influencing the Implementation of the Ondo State Medical Waste Management Bill to Improve Medical Waste Management Practices in Nigeria

Despite having several policies and regulations in place that protect public health and the environment, the management of healthcare waste is still a huge challenge for hospitals in Nigeria, particularly in Akure, the capital city of Ondo State. Due to its hazardous and infectious components, poor management of healthcare waste may lead to far more adverse effects on the environment and people. There is therefore an urgent need for the implementation of an effective regulation of medical waste management practices. To support this, effective research is required to inform and shape waste management policies.

In addition to taking initiatives for improving the quality of teaching at FUTA and providing academic support to his students, Babajide is actively pursuing opportunities for collaborations on research projects. He is thereby creating additional prospects for students to learn and develop.



Babajide (third from the left) poses with his three undergraduate project students (Damilola Ajayi, Korede Adeyemi and Demilade Igotun) in the Department of Biology, Federal University of Technology, Akure (FUTA), Ondo State, Nigeria (January 2024).

This involves offering guidance on the selection of research topics as well as collaborative supervision of research projects. One notable example of his excellent teaching skills and drive for bringing traceable social change is his research project that he conducted in collaboration with one of his undergraduate students in 2016. The collaboration investigated waste management practices in selected hospitals in Akure.

Fundamentally, the research project was a challenging one to implement as Babajide was denied access to several of the health facilities and those who granted him some access, were unwilling to share information on their waste management practices. Through perseverance, Babajide and his collaborating student were able to gain access to 10 Akure-based health facilities and their waste management practices, which helped them better understand the mode of medical waste collection, segregation, pre-treatment, storage, and disposal procedures that have been practiced across the Ondo State.

The findings of the study revealed that the health facilities generally had internal regulations for medical waste management in place, however poor on-the-ground implementation allowed for gaps in the medical waste management outputs. As a result of this, lack of medical waste pre-treatment units, inappropriately situated waste storage structures, and unhygienic conditions of the surrounding infrastructure was widely evidenced during the research project.

Having concluded the research project, Babajide provided co-authorship support to the student leading on the research project and together they published a paper titled: Medical waste management practices in developing countries: a case study of health facilities in Akure, Nigeria. Nevertheless, publishing was not the ultimate outcome Babajide was aiming for. He was determined to influence uptake of his research findings to improve waste management practices in the healthcare sector of the Ondo State. Driven by the desire to contribute to the overall health and wellbeing of his community, he approached the Director of the Waste Management Board in the Ondo state and shared the research findings. Using the communication skills he sharpened during his Commonwealth Scholarship, he presented his findings in such a compelling manner that the Director was motivated to take action and support Babajide in delivering change in his community.

'I made sure that I also went to see the Director of the Waste Management Board in the state, under the Ministry of Environment [to share the findings and to make recommendations]. So, he took it upon himself to make sure he pushed for a bill, because I couldn't really do that. But he had the instruments to push a bill into the State House of Assembly, and then it became a law in the state. So, as I speak to you now, it's prohibited for these healthcare facilities to dispose of waste together with household waste. So, that's one achievement that I was able to get, just by the knowledge that I gained from the Master's course, which is the knowledge of looking for a contaminant in the environment, that is human-driven, and looking for a permanent way to solve it.'

Since the passing of the law, improvements in the waste management practices of the health facilities in Ondo State have been observed. Greater care is now taken to minimise exposure of the medical waste contaminants to public places, thereby protecting the health and wellbeing of the communities contributing to the long-term vitality of the Ondo State.

'I have reduced the burden of the government by pointing their direction to a public health concern, and they've been able to solve that.'

Facilitating Access to Study-abroad International Scholarships

Entrepreneurship is key to spurring economic growth, developing ideas, and finding solutions to societal problems. In 2018, Babajide initiated iLLUMANIA, a startup aiming to reach out to talented students from low-income backgrounds and offering them exposure to the world of study-abroad scholarship schemes. Through iLLUMANIA, Babajide is offering a platform to disadvantaged groups in society who want to continue their higher education journey and are only constrained due to financial barriers. He started off by guiding students at his university and was instrumental in helping over 80 students secure international scholarships within 5 years. Having noticed his efforts in this regard, he was encouraged by the Vice-Chancellor at his university to continue with it, resulting in an informal partnership building with his university.



Babajide addressing members of the Young African Leaders Initiative (YALI) Network in Ondo State, Nigeria, on strategies to secure international postgraduate scholarships (August 2023).

'They get me the venue, they get me anything I need, and then I deliver the training. So, that's a partnership that I've done with my school so far. I now ... do that with other schools, something I decided to call "International Scholarship Mastery Bootcamp", ISMB.'

Having seen how the Commonwealth Scholarships have transformed his life, he realised he could support other bright, brilliant, and talented students from Africa by providing them guidance and advice on writing essays for scholarship applications. He believes that scholarships help aspiring young students by liberating them, not only financially but in every other way.

'Having won multiple international scholarships including the Commonwealth Scholarship for my Master's and PhD degrees, I was inspired to create iLLUMANIA, a platform that provides scholarship application guidance and other academic services.'

Established in 2018, iLLUMANIA is an online educational consulting outfit that provides a wide range of academic support to students, graduates, and business professionals. The services include reviews of CVs, research projects, research proposals and scholarship essays. Additionally, they offer career counselling services helping aspiring youth explore career options, develop strategies for searching jobs, write compelling job applications, and prepare for interviews.

In the last four years, iLLUMANIA has successfully supported several aspiring students to successfully apply for international scholarships to pursue higher education goals abroad. Following his passion to contribute to national development and promote education, Babajide has been contributing to human capital development across the African continent.

'I have contributed to human capital development across the continent to date by helping over 250 Africans from Ghana, Cameroon, Kenya, Botswana, and South Africa to pursue their career dreams abroad via international postgraduate scholarships; attracting about US\$10 million in scholarship benefits.'

Babajide's experience of the Commonwealth Scholarships that he won both for his Master's and PhD degrees has been his inspiration to initiate iLLUMANIA. The way Commonwealth Scholarships served as a gateway to a global education hub, and how the expansion of academic opportunities, cultural immersion, and personal growth Babajide experienced during his stay in the UK is well reflected in the nature of the services iLLUMANIA is offering to talented students.

Furthermore, for his impact on the community and services to students aspiring for international scholarships to study abroad, he has received recognition at the national level.

'This feat earned me both national and international awards such as the Royal African Leadership Award (presented by the Ooni of Ife, Oba Adeyeye Enitan Ogunwusi Ojaja II, and Nigeria's Federal Minister of Youth and Sports, Mr. Sunday Dare in 2021) and recognized as the University of Greenwich's Alumni Portrait of 2021 (presented to outstanding Alumni making waves in their home country).'

Combining his personal experience with the Commonwealth Scholarships and the time spent in the UK, he has been providing guidance on how to gain access to quality education and through iLLUMANIA he has been able to support 250 students successfully.

Babajide identified establishing iLLUMANIA as the most significant change that he brought to his local community as a result of the Commonwealth Scholarship.

The most significant change in my community (and beyond) as a result of my Scholarship/Fellowship is definitely my achievements with iLLUMANIA. Before creating iLLUMANIA, a platform that provides sufficient international postgraduate scholarship guidance, Nigerian students, and graduates, particularly from the Southwest, were unaware of fully funded international postgraduate scholarships and hardly applied for such opportunities. Upon creating iLLUMANIA and taking it directly to universities in the southwest, leveraging my experience as a lecturer, I was able to cause a scholarship buzz in my community, which reverberated across the region. Since 2018 to date, graduates of Nigerian universities applying for Master's/PhD scholarships abroad have probably tripled, and more than half of them are winning international scholarships at first or second attempt. Leveraging social media, I used my platform to constantly inform and inspire my audience on the need to take advantage of scholarship opportunities, and this expanded my impact beyond Southwest Nigeria, to five other African countries. In total, I was able to produce 250 scholarship winners across Africa in 4.5 years: attracting scholarship benefits of up to 10 million USD.

'I am most proud of myself for being the reason a brilliant student from a remote community in Nigeria gains access to globally recognised universities abroad (at no cost) to better his career and family's fortune. This, indeed, is my most significant impact on my community.'

Babajide plans to expand iLLUMANIA which is currently covering six African countries to reach 15 and to constantly have at least 100 to 500 beneficiaries each year by 2030.

Creating Access and Inclusion for Researchers in Africa

In addition to scarce resources, unavailability of appropriate laboratory equipment is another major challenge that researchers in Africa are currently facing. Access to laboratories, equipment and technology is an essential prerequisite for conducting experimental research successfully. In addition to iLLUMANIA, in 2022 Babajide co-founded Wadi, a digital platform that connects researchers to resources to compliment research and development (R&D) in Africa.

'Having experienced a digitalised process of accessing research equipment at the University of Manchester, I transferred a similar idea upon my return to Nigeria to resolve the problem of poor access to research equipment by creating Wadi.'



Wadi founding members (from Left to Right): Augustine Noah (Chief Operating Officer – COO); Amanda Madumere (Chief Product Officer – CPO); Ella Eze (Chief Marketing Officer – CMO); Babajide Milton Macaulay (Chief Executive Officer – CEO); Toheeb Ojuolape (Chief Technology Officer – CTO) (July 2022).

Wadi is a direct result of Babajide's experiences during his Commonwealth Scholarship-funded tenure in the UK. While studying at the University of Manchester, Babajide noticed how digitalised processes of locating and accessing research equipment and technology could make a massive improvement on his research results and study objectives, convincing him to replicate the system as soon as he was back in his home country.

Wadi is barely a year old, and it has already started attracting investment grants totalling to 16.5 million naira between August and December 2022. Babajide believes that receiving the Commonwealth Scholarships award has opened up a world full of opportunities for him. He has noticed that the credibility and prestige that comes with the UK higher education system has earned him trust from funders who have issued grants for his start-ups.

'Because I studied in the UK, I noticed the moment I got back, there was this perception of credibility I started getting in my community. If I had studied in Nigeria, I wouldn't have gotten the same level of respect that I get for studying in the UK. I noticed that in my country, there is this air of respect that revolves around you, and I've enjoyed it a lot. In fact, it's the reason why I was able to raise investment capital for my second start-up.'

The key funders who have supported Wadi include a group of angel investors such as the Nigerian University of Technology and Management (NUTM), Grooming Endowment Trust (GET) and the Nimbus Media Group. He strongly believes that he would not have received so much success with Wadi if he had not received the Commonwealth Scholarship and the opportunity to study at the University of Manchester.

'On getting back home, I knew that a solution would technically be to set up a platform that uses a geolocator tool and then tells us where the equipment is closest to you, and that way it reduces the cost of transporting your samples there. Wadi is a platform that connects researchers to equipment, using a geolocator tool, and that way we solve the problem of access to equipment.'

Wadi's flagship products are Send-Sample and PublishIT. Send-Sample helps to connect researchers to equipment using a geolocator feature, offering a solution to the problem of poor access to analytical instruments which could ultimately lead to localised inventions and innovations. PublishIT, on the other hand, is a research writing support platform where research projects are transformed into ready-to-publish manuscripts which can then be sent to a publishing houses or research journals. This is particularly useful for African researchers whose first language is not English and who struggle with writing about their lab discoveries.

'I collaborate with laboratories that have got research equipment ... in Africa, some private investors could just build a lab and stock it with research equipment and run it as a business.'

Babajide is currently collaborating with private investors who invest in constructing laboratories and run those as their source of income. Presently, Wadi is targeting students who might need support to find equipment, tools, and supplies for conducting experimental research. Their marketing strategy involves word of mouth and Campus Ambassadors who are responsible for providing relevant information to students at their respective campuses. Since launching the two flagship products (Send-Sample and PublishIT) in January 2023, Wadi has facilitated 39 clients - including final year undergraduate and postgraduate students and lecturers of higher education institutions. Wadi is continuously working on expanding its outreach by improving on its marketing and publicity channels.



Babajide (middle) awarded the Royal African Leadership Award by the Ooni of Ife, Oba Adeyeye Enitan Ogunwusi Ojaja II (right), and Nigeria's Federal Minister of Youth and Sports, Mr. Sunday Dare (left), for assisting African youths secure global academic scholarships through iLLUMANIA (May 2021).

Looking ahead, Babajide hopes that in the next two to three years he will be able to extend the scope of Wadi and achieve nationwide coverage. He hopes that in the long term, Wadi will be adopted by the universities as a platform to provide technical support to their researchers and students. He also hopes that he could extend the partnerships to labs in the UK offering African researchers access to world class international research environment.

'I do not mind getting a partnership with research institutions and labs in the UK with expensive analytical instruments that are scarce to find in Africa. Such partnerships will enable Wadi serve local researchers better to send their samples to the UK for analyses, as not all labs in Africa have got the equipment needed to conduct cutting-edge research.'

Africa is currently contributing only 1% to global research outputs, yet its population will constitute close to one-fifths of the world's population by 2025. Babajide's work widens access to higher education and vital laboratory resources, improving research and development in Nigeria and beyond.

More about Babajide Milton Macaulay

Find out more about the start-ups by visiting the websites:

<https://iLLUMANIA.org/>

<https://www.wadi.africa/>

Medical waste management practices in developing countries: a case study of health facilities in Akure, Nigeria.

Access here:

<https://www.inderscienceonline.com/doi/abs/10.1504/IJEW.2016.076756>

Access additional published work here:

<https://scholar.google.co.uk/citations?user=WRzEbfoAAAAJ&hl=en&oi=sra>

Commonwealth Scholarship Commission in the UK

Woburn House

20-24 Tavistock Square , London WC1H 9HF

Email: evaluation@cscuk.org.uk

Website: bit.ly/cscuk-evaluation

