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THE NATIONAL ASSEMBLY

THIRTEENTH PARLIAMENT – SECOND SESSION – 2023

DIRECTORATE OF DEPARTMENTAL COMMITTEES
DEPARTMENTAL COMMITTEE ON EDUCATION

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REPORT ON:

STUDY VISIT ON DIGITAL TRANSFORMATION IN EDUCATION
11TH TO 18TH MAY, 2023
ESTONIA

THE NATIONAL ASSEMBLY

DATE: 0 9 AUG 2023 DAY. WED

TABLED BY: Hon (Dr.) Christine Ombaka, mp
Member, Education Committee
CLERK-AT THE TABLE: Miriam modo

DIRECTORATE OF DEPARTMENTAL COMMITTEES
PARLIAMENT BUILDINGS
NAIROBI

AUGUST 2023

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LIST OF ABBREVIATIONS AND ACRONYMS

GDPR	:	General Data Protection Regulations
ICT	:	Information and Communication Technolgy
IT	:	Information Technology
NGO	:	Non Governmental Organization
PISA	:	Programme for International Student Assessemtent

CHAIRPERSON'S FOREWORD

Estonia is an innovative nation in Northern Europe known for its digital transformation. Thanks to smart e-solutions created here and which developed between a visionary government, a proactive IT Sector and a switched on, tech-savvy population. It takes only a few hours to start a company and minutes to declare taxes. The nation is among the top countries in Europe in terms of start-ups per capita and ranks first as one of the most start-up friendly countries in Europe according to Index Venture 2021.

Many countries benchmark with Estonia throughout the year on digital transformation while seeking partnership and collaboration in various areas. Whereas Estonia is a small budget country, transparency, accountability and effective utilization of the little resources available had seen the country record remarkable economic growth.

It is against this backdrop that the Departmental Committee on Education resolved and undertook a benchmarking tour of Estonia's digital learning in academic institutions from 11th to 18th May, 2023. During the tour, the Committee visited and or interacted with the following-

(i)   Mr. Daniel Shaer, African Ambassador, Ministry of Foreign Affairs
(ii)   Mr. Kristel Rilo, Head of Education and Entrepreneurship Programme, Estonian Centre for International Development
(iii)   Estonian e-Briefing Centre
(iv)   Opiq Company
(v)   Dream Apply Company
(vi)   Mr. Vadin Belobrovtsev, MP, member, Parliamentary Committee on Education, Sports and Culture
(vii)   The Tallin University of Technology
(viii) NGO Mondo

The delegation comprised Hon. (Dr) Christine Oduor Ombaka, MP with Mr. George Gazemba, Principal Clerk Assistant I serving as secretary. Hon. Abdul Ebrahim Haro, MP was to be part of the delegation but withdrew from the trip at the last due to unavoidable circumstances. The delegation travelled to Estonia on 9th May and returned on 12th May, 2023.

The tour was organized and coordinated by the Estonian Centre for International Development. Arising from the tour and interaction with the hosts, the delegation made a finding that Estonia had recorded remarkable digital application success in the education and other sectors worth borrowing from by Kenya. The digital government in Estonia was entering its third decade with focus on using digital technology, services and culture to make Estonia the best in the world.

I take this opportunity to thank the Offices of the Speaker and the Clerk of the National Assembly for the support and facilitation accorded to the delegation to undertake the benchmarking. May I also expresses gratitude to the various Estonian organizations and individuals who organized and coordinated the tour as well as those who hosted the Committee's delegation during the tour and

shared invaluable information. I also wish to express gratitude to the delegation secretary for work well done in providing technical and logistical support to the delegation.

On behalf of the Departmental Committee on Education and pursuant to National Assembly Standing Order 199(6), it's my privilege and duty to present to the House, for noting, a report of the Committee on Estonia's digital transformation in education benchmarking.

Hon. Julius Melly, M.P.
Chairperson, Committee on Education

PART I

1. PREFACE

1.1 Establishment of the Committee

1. The Departmental Committee on Education of the National Assembly is established under Standing Order 216 whose functions pursuant to the Standing Order 216 (5) are as follows:-

    (a) *investigate, inquire into, and report on all matters relating to the mandate, management, activities, administration, operations and estimates of the assigned Ministries and departments;*
    (b) *study the programme and policy objectives of Ministries and departments and the effectiveness of the implementation;*
    (c) *on a quarterly basis, monitor and report on the implementation of the national budget in respect of its mandate*
    (d) *study and review all legislation referred to it;*
    (e) *study, assess and analyze the relative success of the Ministries and departments as measured by the results obtained as compared with their stated objectives;*
    (f) *investigate and inquire into all matters relating to the assigned Ministries and departments as they may deem necessary, and as may be referred to them by the House;*
    (g) *vet and report on all appointments where the Constitution or any law requires the National Assembly to approve, except those under Standing Order 204 (Committee on Appointments);*
    (h) *examine treaties, agreements and conventions;*
    (i) *make reports and recommendations to the House as often as possible, including recommendation of proposed legislation;*
    (j) *consider reports of Commissions and Independent Offices submitted to the House pursuant to the provisions of Article 254 of the Constitution; and*
    (k) *examine any questions raised by Members on a matter within its mandate.*

1.2 Mandate of the Committee

2. In accordance with the Second Schedule of the Standing Orders, the Committee is mandated to consider matters on education, training, curriculum development and research.

3. In executing its mandate, the Committee oversees the Ministry of Education and the Teachers Service Commission. The Ministry of Education comprises three Departments namely;

    (i) State Department for Basic Education;
    (ii) State Department for Technical and Vocational Education and Training.
    (iii) State Department for Higher Education and Research.

1.3 Committee Membership

4. The Committee was constituted by the House on Thursday 28th October, 2022 and comprises of the following Members: -

Hon. Julius Kibiwott Melly, MP
Chairperson
Tinderet Constituency
UDA Party

Hon. Moses Malulu Injendi, MP
Vice Chairperson
Malava Constituency
ANC Party

Hon. Dr. Christine Ombaka Oduor, MP
Siaya County
ODM Party

Hon Julius Taitumu M'Anaiba, MP
Igembe North Constituency
UDA Party

Hon. Eve Akinyi Obara, MP
Kabondo Kasipul Constituency
ODM Party

Hon. Nabii Nabwera Daraja, MP
Lugari Constituency
ODM Party

Hon. Jerusha Mongina Momanyi, MP
Nyamira County
Jubilee Party

Hon. Peter Ochieng Orero, MP
Kibra Constituency
ODM Party

Hon. Abdul Ebrahim Haro, MP
Mandera South Constituency
UDA Party

Hon. (Prof.) Phylis Jepkemoi Bartoo
Moiben Constituency
UDA Party

Hon. Anne Wanjiku Muratha, MP
Kiambu County
UDA Party

Hon. Rebecca Noonaishi Tonkei, MP
Narok County
UDA Party

Hon. Clive Ombane Gisairo, MP
Kitutu Masaba, Constituency
ODM Party

Hon. Timothy Kipchumba Toroitich,MP
West Constituency,
Independent Party

Hon. Dick Oyugi Maungu, MP
Luanda Constituency
DAP-K Party

1.4 Committee Secretariat

5. The Committee secretariat comprises: -

Ms. Grace Wahu
Clerk Assistant III
Lead Clerk

Natecho Kisiang'ani
Clerk Assistant III

Eric Kanyi
Fiscal Analyst II

Martin Mburu
Research Officer

Eric Kanyi
Fiscal Analyst II

Roselyn Ndegi
Serjeant-at-Arms

Daniel Psirmoi
Media Relations Officer

Josephine Osiba
Hansard Reporter

Brigitta Mati
Legal Counsel I

Winnie Kulei
Research Officer

Brigitta Mati
Legal Counsel I

Winnie Kulei
Research Officer

Paul Kashane
Serjeant-at-Arms

Nimrod Ochieng
Audio Recording Officer

Margaret Kamande
Protocol Officer

PART 2

2.0   INTRODUCTION

6.   Education in Estonia dates back to the 14th century when the first cathedral schools were founded. The first university was established in the year 1632, The University of Tartu. University courses were first taught in Estonian in the year 1919. One of the biggest contributors to the Estonian education system was Bengt Gottfried Forselius. He established the first educational institution where students were given lectures in the Estonian language mixed with some Latin. He also republished the purified version of the Estonian alphabet.

7.   One of Estonian strengths internationally is digitization most importantly in the education sector.   Many countries benchmark with Estonia throughout the year on digital transformation while seeking partnership and collaboration in various areas. Whereas Estonia is a small budget country, transparency, accountability and effective utilization of the little resources available had seen the country record remarkable economic growth.

8.   It is because of Estonia's digital advancement in the education sector, that the Departmental Committee on Education resolved and undertook a benchmarking tour of Estonia's digital learning in academic institutions. The tour was undertaken from 11th to 18th May, 2023 during which, the Committee visited and or interacted with the following in the Estonia's ca-

     (i)   Mr. Daniel Shaer, African Ambassador, Ministry of Foreign Affairs
     (ii)   Mr. Kristel Rilo, Head of Education and Entrepreneurship Programme, Estonian Centre for International Development
     (iii)   Estonian e-Briefing Centre
     (iv)   Opiq Company
     (v)   Dream Apply Company
     (vi)   Mr. Vadin Belobrovtsev, MP, member, Parliamentary Committee on Education, Sports and Culture
     (vii) The Tallin University of Technology
     (viii) Mondo NGO

9.   A synopsis of what the Committee learnt from the tours and interactions forms Part II of the report.

PART 3

3. WHAT WAS LEARNT FROM THE BENCHMARKING

(i) About the Estonian education system

4.   The education system is divided into four levels which include the pre-school, basic, secondary and higher education. Schools are state, municipal, public or privately owned. Preschool is for ages 3 to 6 years and is provided at Kindergartens and other childcare institutions. Preschool education is not compulsory but still receives up to 90% enrolment because many parents go to work and would prefer their kids going to school as opposed to staying at home under care givers who are costly or not available.

5.   From preschool, students join primary school in Grade 1 for basic education at the age of 7 and continue for secondary education until the age of 16 when they sit a standardized examination whereby they choose between high School and vocational School. On average 70% of the students would proceed to high school while 30% to vocational schools after sitting entry examination.

6.   There are usually two types of schools for higher education Estonia. Universities and Higher Schools of Applied sciences. A three year studying course in a university earns one a Bachelor's Degree, obtaining a Masters Degree takes two more years. Getting a diploma in a school of applied sciences usually takes 3 years.

7.   Education in Estonia is 100% subsidized by the Government for those attending Government schools. Furthermore, all students have a medical insurance cover paid for by the Government. Among the medical services provided under the insurance cover are counselling, psycho social support and speech therapy.

8.   All schools in Estonia are internet connected. ICT infrastructure modernization is a continuous exercise undertaken by the Government. Internet speed is fast with no interruptions. The wife network for the students and teachers is different. This is to ensure teachers' data is well secured and protected from students. Continuous professional development training programmes are run throughout the year and are mandatory for all teachers. The training is fully funded by the Government.

9.   Students in Estonia access books and other reading materials digitally from service providers at a fee paid by the Government. The country has developed education robots which students use in problem solving in class and home. 99% of kindergarten students have access to education robots which they use in problem solving. The country has further developed drowns for use at school level to measure wind and other uses.

10.   Towards digital learning, a computer can be shared amongst students in class. Students can also use smart phones. The most important aspect of digital learning is the access to a

computer and projector facilities by the teacher in class. The robots used in class cost 60 Euros and don't require internet. They only require to be charged when out of battery charge.

11. Internet connectivity was initially a challenge in digital education implementation. The challenge was subsequently addressed thereby making Estonia as one of the most digitized country in the world. The Education system in Estonia enables children to learn digital skills from kindergarten. Further the E School system enables parents to monitor what students did in school as well as what teachers did.

(i) Kenya/Estonia relationship

12. The relationship between Kenya and Estonia had been growing in the last three years. The state visit to Kenya by the Estonian President in the year 2021 strengthened the relations further. Estonia was set to open its second Embassy in Africa in Kenya in 2023 the first Embassy having been established in Egypt.

13. Lack of a Kenyan Embassy in Estonia was a factor in slowing down strengthening of relationship between Estonia and Kenya and urged the Kenyan Government to consider opening an Embassy Tallinn. Notwithstanding this challenge, he was looking forward to the formation of a friendship group between Kenya and Estonia.

14. There are studying opportunities in Estonia especially in information technology in which Estonia had recorded much success. A number of foreigners including Kenyans were already studying in Estonia and urged more Kenyans to considered applying for scholarships

15. The Estonian Government issues scholarships to Kenyan students and many Kenya students had benefited. During the tour, the Estonian Development Agency hosted the delegation and some Kenya students for dinner. Strathmore University was also running some programmes in partnership with the Estonia University.

16. Kenya is Estonia's largest partner in Africa in digital transformation with over twenty (20) projects under implementation by the two countries. In the education sector, Estonia is working closely with the Kenya Institute of Curriculum Development toward digital transformation in curriculum development and digital skilling. The Estonian Government officials were to visit Kenya in mid May 2023 to meet Ministry of Education, Information and Communication as well as Health Officials with a view to signing Memorandum of Understanding on new projects.

(ii) Edtech Estonia Innovation Education Technology

17. Education technology refers to an area of technology devoted to the development and application of tools (including software. Hardware and processes) intended for education. Ed Tech Estonia brings together and presents Estonian Ed Tech companies. To make Estonia the leading Ed Tech Country. As an innovation driven nation with very autonomous schools and teachers. Estonia is an ideal testbed to develop new educational technologies.

18.   Estonia has become a successful role model in education worldwide. Estonian basic education is 1st in Europe and among the best in the world. The aim for Estonian entrepreneurs is to take a significant stake of exportable education niches. Edtech Estonia supports companies through joint projects Metro ring services and marketing.

19.   Education happens within the context of a larger community. Its approach extends beyond the school to help ensure students have the necessary support to do their best learning.

20.   Edtech Estonia is supported by Education Estonia and Startup Estonia. Education Estonia is an initiative for international education cooperation initiated by the Government of Estonia. PISA 2018 shows Estonia ranks 1st in education and digital transformation. Estonia is eager to share know-how and offer innovative solutions created by Estonian companies and organizations that help to advance its education system, whether it is digital solutions consulting, training or other. Education Estonia is the guide to smart solutions for education innovation.

21.   Startup Estonia is governmental initiative aimed to supercharge the Estonian startup ecosystem in order to be the birthplace of many more startup success stories to come. Estonia is working round the clock to ensure its one of the world's best places for startups partnering with and uniting the best of startups incubators, accelerators, private and public sectors.

22.   Estonia is known for its strong and equitable education system and its flexible e-state. This approach is also supported by growing Estonian EdTech Sector, Impactful technological solutions, over the distance learning as well as classroom based learning has given learners the opportunity to learn continuously. Technology is an unquestionable part of education and the Government of Estonia's cooperation with Ed Tech Estonia is a solid proof of it.

(iii) 99 M

23.   99math is a free tool for teachers and schools to engage students and it works as a platform for game based math practice. Math problems are generated based on teacher's preferences, and students play with their own devices. 99math has multiplayer math game that teachers use in classrooms around the world. After debuting as a beta tool in 2019, 99math grew into a gaming platform for kids with over 500,000 users. Together, students in 99math have solved over 200 million math problems. It turns out one of the tricks to get children into math is to get kids competing with each other in classroom.

(iv) ALPA Kids

24.   ALPA Kids develops e-leaning games for children aged 2-8 their parents and teachers to help children learn the essentials like colors, numbers, the alphabets etc. through the examples of their own culture and local nature. The ALPA Kids is easily adaptable to any language and culture worth the focus on localizing the e-leaning games for less spoken languages.

25. ALPA games are created in collaboration with Estonian TOP schools and preschools. The games are localized for new markets together with local teachers. The games are divided into four difficulty levels to be as age- appropriate for the child as possible. ALPA curriculum consists of more than 60 e-learning games.

26. ALPA app suggests new learning content based on the analysis of the child's acquired knowledge and skills set. Teachers can use ALPA games on tablets, computer and smart boards. Parents can continue the lessons at home by downloading the ALPA Kids app.

(v) Bizplay

27. A unique combination of physical games and an online platform to teach about the economy and develop entrepreneurial mindset and teamwork skills. Bizplay is not just screens and online but real hands on experience with need to combine both physical and digital interaction. Players will play face to face, simulating real life challenges that need to be solved creative. Online platform are web-based, so it can be used from every device. Programs topics and difficulty labels are suitable for various age groups to achieve their learning goals.

28. Entrepreneurial role-playing games are for children and young people that simulate real life. Each game is run by facilitator, who supports and guides the students and helps analyze the results, thus creating a learning game from a fun game. The gaming environment is a mixture of digital and physical. Using a web-based gaming platform, the game can be conducted in the classroom.

29. The Bizplay academy helps teachers to make lessons exciting and useful for students through Bizplay programs. The academy includes an online learning environment with instructional videos and instructions on how to facilitate each game and course.

(vi) Clanbeat

30. Clanbeat is a digital toolkit for building motivated, inclusive and flourishing learning communities. Clanbeat provides a positive cycle of planning, acting and reflecting to support the self-directed learning and well-being of students. It also monitors how students feel, perform and learn, in addition to developing positive habits and good relationship with themselves and their peer also from reflecting the data back in the form insights for improvement. The end result is a solution that supports and motivates each student to nurture his or her passions, make connections between different learning experiences and opportunities to design their own learning and processes in collaboration with others.

31. Through clanbeat, teachers:-

   a. Identify potential issues and risks early with data driven well- being and mood insights collected from students' surveys.
   b. Helps students develop healthy habits get to the heart of their needs faster and save hours of time every week.

c. Check in and chat anyone in your group. Give personal feedback and make class-wide announcements easily.

32.   Through clanbeat, students-
   a. Make tackling school work easier by learning to understand and manage your moods.
   b. Chat, share pictures and celebrate your highs and lows together with your class group and teacher.
   c. Find the best support for you need it, quickly and calmly.
   d. Develop the skills like planning and reflecting to make learning work for you-forever.

33.   Through clanbeat, school leaders-
   a. Increase engagement, happiness and student success by understanding and acting on real-time data.
   b. Swiftly identify requiring attention and improve planning for greater school results with school insights

(vii)   CoNurse

34.   CoNurse is a voice guided clinical protocol adherence and deployment mobile application. The platform allows nurses and caregivers to access voice guided step-by step instructions directly on their smartphones. This way the application supports the nursing team at the point of care by providing easy access and by enforcing adherence to protocols. CoNurse's aim is to improve care quality and standardization across the care continuum.

35.   CoNurse is a digital health company building IT solutions for healthcare professionals and patients. The application focuses on improving guideline adherence to improve care quality and outcomes. Key functionalities include mobile application controlled via bluetooth headset and that seamlessly integrates into the clinical workflow: and a content management system that allows users to manage and create customized clinical content.

36.   Key benefits of CoNurse include patient safety through reduced occurrence of adverse events, reduced cost for hospitals via more effective onboarding and decreased costs in relation to adverse events, and staff and patient wellbeing as co nurse enhances the working environment, empowers clinical staff and decreases burnout and stress.

37.   CoNurse's aim is to address preventable adverse events by making clinical guidelines accessible and actionable at the point of care. It turns complex instructions and guidelines into compact voice- guided step by step checklists that nurses can easily follow during clinical procedures.

(viii)   Edumus

38.   The 21st century schools need new kind of teachers. Scientists, developers, engineers and other professionals are required in schools to teach and share their real knowledge, Edumus

training programme and facilitating software systems were developed in Estonia and help to connect working professionals with schools.

39. From signup to closed deal, the Edumus platform helps to manage the whole process. It allows interested professionals to sign up into the programme and schools to browse, contact and sign contracts with edumus teachers.

40. The training program is specifically developed for people without previous academic teaching background. It gives just enough knowledge to go in front of the class and ensure they have the best possible teaching experience. The application's curricular hosts a selection of predeveloped courses for learning scientific skills that are relevant in today's job market. Ne Edumus teachers can access course and teach them in schools around the world.

(ix) Einsteins Square

41. Einsteins Square was formed by the founders of global preschool chain Little Einsteins. Having a decade of experience in preschool and primary education, Einstein Square was a solution to the online education system where classes are conducted in live sessions for small groups. These classes focus on the 21st century skills ensuring collaboration, communication, creativity and critical thinking.

(x) Ekool

42. Ekool is a school management tool bringing together students and their families, schools and supervisory bodies. It all began in 2002 as a project financed by private and public sector to develop the first ekool system based on the needs of schools in Estonia for daily use in communication between the school, home and government.

43. Ekool is an easy accessible web-based school management system that has made traditional paper format class diaries obsolete in Estonia. It supports students in their learning process, parents are aware of their children's progress in school, teachers have less administrative work and authorities have a good overview of what is going on in schools under their management. Whether the user is a headmaster, teacher, parent or a student, he or she can log in with their personal computer or mobile phone and see the necessary information.

44. Ekool supports a student during the entire school journey from parents submitting a child's application to a school, having an overview of grades, home assignments, study materials, lesson descriptions, and absence during school time until graduation and final grades. Ekool is a module based school management platform that can be easily launched in different markets and language environments. Ekool is a member of a group of companies with about 2 million clients in five countries.

(xi) Eliis

45. Ellis is platform for preschools, daycares kindergartens and nurseries helping teachers and parents to enhance preschool operations, child development and communication. Ellis was

founded by five education and technology enthusiasts with the goal to improve the quality of early childhood education. Since launching, more than 600 early childhood institutions in have joined Eliis.

46.   Eliis includes numerous functions for teachers, parent's daycare management and local government. Our solution is available for all devices using a web browser or mobile application which makes it easy for parents to send and receive notifications. Eliss is intuitive, even for those familiar with technology. Platform is transparent, auditable and fully protected against non- authorized users.

47.   Feedback has been very positive kindergarten teachers have been freed from filing large quantities of paperwork especially reports and can dedicate more time to children. Parents are happy because of the fast easily accessible feedback about their children and their daily activities in preschool or kindergarten. Mutual communication has become more convenient, accurate and timely.

48.   Statistics show more than 20,000 teachers are using Eliis every day and Eliis saves more than 30 minutes of teacher's time per day. More than 250 000 children have been added to ELIIS. 100 000 + parents are using Eliis via mobile application and web browser. More than 100 TB of photos has been uploaded to ELIIS. Over 100 million notifications has been sent via ELIIS.

(xii)   Futuclass

49.   Futuclass is an educational platform with gamified lessons for upper middle school chemistry and physical topics. Co-created with leading natural science teachers and schools, futuclass VR lessons are highly effective and deliver- 60% average improvement in results over traditional methods.

· 50.   Teachers use Futuclass VR lessons for science classes across the world. Teachers can track student progress on easy- to-use web page and see their VR lesson results. Students report super high engagement rates (especially the rowdy ones) while achieving much better test results after 30-60 minutes play sessions.

51.   Each VR lesson comes with a lessons plan assembled by experts, including reflection topics, online test and teacher's notes. Futuclass is easily accessible through major VR platforms like oculus or steam. License is required to access all content.

52.   Futuclass was developed in collaboration between schools, science teachers, educational designers and game designers. Every futuclass VR lesson is designed to fit the curriculum. The development process of VR lessons involved many interactions based on the feedback that was gathered from usability tests with hundreds of students in public schools. Teachers and educational designers have given feedback at every step development, providing ever more learning value and leading to higher educational results.

(xiii) Helge

53. Helge helps young people track their thoughts and feelings to understand them elves better. Helge Has a toolset that helps youngsters and adolescents become better self-aware by providing them information about their mental health situation and guidance.

54. Through the application, 13-19 year old students do a regular quiz that measures their subjective mental well-being and provides with suggestions. Youngster- become better aware about their well-being while schools become better aware about the dynamics in their classrooms. Parents on the other hand understand better well-being of their children.

(xiv) Lingvisit

61. Ling visit is built by top scientists, engineers and language experts, combining the latest research in machine learning with personalized language courses. To support users from all over the world Lingvisit is available in 13 languages namely American and British English, French, German, Spanish, Russian, European, Brazilian, Portuguese, Estonian, traditional and simplified Chinese, Japanese and Hindi.

(xv) Loquiz

62. Loquiz was founded in 2010 and since is used in more than 35 countries by schools, event companies, outdoor activity providers, team building trainers. Games created with the platform have been proven to engage entertain and educate people from school children to executives of world leading corporations.

63. The application's mission is to help children become more active and add an element of fun to leaning. Every teacher can gamify their subject with Loquiz and turn it into a game. Loquiz is also great tool to take classes outside and help pupils be more physically active.

64. Loquiz platform allows turning educational content into physically active game. According to teachers using Loquiz, game based leaning is the best way to truly engage pupils as well-crafted games provides the necessary challenge to hold attention, physical activity to include endorphins and increased creativity to induce endorphins and increased creativity and at the same time effectively fulfils the desired learning goals.

65. Loquiz brings an innovative gamification platform for school teachers to provide pupils with more engaging leaning experience regardless of the study content in a way that makes pupils more active physically-indoors and outdoors. With loquiz teachers connect logic exercises, abstract questions, orienteering with GPS, creativity exercises like photo hunting, with physical movement to achieve learning goals.

(xvi) Mentornaut

66. This is a platform that connects students with tutors. Its goal is to provide personalized learning for students at the local level. Through that, it can support each and every student in reaching their maximum academic potential. Great students need great teachers which is why the platform puts a lot of efforts into finding the best tutors, who know how to bring out the best in students and help the learn in a safe and creative environment.

(xvii) Mobi lab

67. Mobi lab focuses on digital products design and development for augmented reality and mobile. Its mission is to make technology easy to use by people on mobile devices. With mobi labs augmented reality solutions developing better digital products for teaching and learning becomes easier and cheaper. Educational companies and publishers can quickly integrate the solution into their existing systems and access all the benefits offered by augmented reality technology.

68. Key features

   a. Web UI for uploading the assets (3D models, 3 D animations, audio and metadata)
   b. Mobile UI for creating scenes (combinations of assets) and placing (anchoring) them into indoor or outdoor environments
   c. Mobile UI for discovering and interacting with the scenes.

69. We may learn best through real- life experiences, but when that is hard to achieve in a classroom or at home, augmented reality is an awesome alternative that makes kids excited to learn. The variety of such solutions is unlimited- similar learning tools can be used by different age groups for different purposes in different settings

(xviii) Multikey

70. This is a next generation language practice network and marketplace. Estonia has already launched an application which guarantees maximum success in language learning. Multikey beats competitors by creating new algorithms and social mechanisms involving people that previously were not part of the market, utilizing previously unseen potential and making language learning a natural part of daily life.

71. Key features of the application include –

   a. Find people nearby for language practice
   b. Chat with them offline or online
   c. Filter for languages you want
   d. See venues that welcome language practitioners
   e. Browse a catalogue of offline and online language courses
   f. Teachers can create structured courses on the platform for students to take
   g. Teachers can grade homework, give feedback, chat with students directly and earn money with their work

(xix) Opiq

72. Opiq offers a wholesome approach to digitized curriculum, improved access to high-quality education and data-driven decision making. Opiq collaborates with the leading educational publishers and public sector institutions as well as process user data in compliance with GDPR and protect publisher's Internet Protocol.

73. Opiq CMS for publishers combines traditional word processing and design software in a web-based, secure cloud environment. It offers publishers account and access management,

content repositories, branding tools and more. Opiq Study Kit Format works on any device and has a rich assortment of content and exercise types.

74. Opiq has dedicated roles for teachers, pupils, parents, school administrators, private users, editors and system admins. Teachers create courses, assign tasks and set bookmarks, manage classroom and homework, add their own learning content to chapters and create exercises. Pupils have personalized and relevant courses, highlighted tasks and chapters and can access any content by search and related content.

75. Proven through COVID-19, Opiq was already widely used in schools when the global pandemic struck. It helped the education system to succeed during the difficult times. Data-Driven Decision Making, Opiq collects usage data and provides highly structured analytics to different stakeholders to improve the content, user experience and insights to learning processes.

Opiq Software 8, Services Suite

Opiq : DLE & Opiq is a digital learning environment where the study kits from the library become accessible and personal.	Opiq CMS Opiq CMS is a publisher's workspace for creating cutting edge learning materials, study kits.	Opiq Data Dashboard A data analytics tool for all stakeholders —publishers, schools, educational leadership and policy makers.
Study Kit Format The study kit bundles together a pedagogically essential textbook format and the new opportunities of ICT. It is a highly structured, responsive, HTML5 content format.	APIs & Third-party Integrations Opiq integrates to the digital ecosystem. Examples include eKool, Stuudium, MPASSid, Mobi Lab, your market needs Read Speaker, and school your Elastic search etc.	Digital Transformation We can digitize your content, create strategies and business models, localizing Opiq to fit your market needs and school your employees to master OPIQ

(xx) ***Praktikal***

76. Natural sciences and mathematics lessons are not fun and inspiring. Teachers are not comfortable with science and struggle to prepare effective but still engaging lessons. Students don't enjoy science lessons and aren't able to use science to solve real-life problems. Schools lack the required materials for practical activities.

77. Natural sciences are the only subjects that are mostly the same around the globe. So the problems are ubiquitous: there are not enough science teachers and existing resources are outdated and expensive. There are around 70M students in 54000 schools in Europe alone and most schools don't have the resources to provide practical learning opportunities.

78. *Praktikal* is working to solve these problems. Estonia is developing practical teaching-learning sequences based on hands-on activities to help teachers provide effective and

engaging lessons. Our experiment kits will cost the school the same as printed textbooks and workbooks do today.

79. Teaching-learning sequences (TLS) that are practical, project-based and adaptable are at the core of *Praktikal*. TLS are created, managed, shared and used in a single web-solution. The Application provides schools with project kits and materials which are affordable, reusable and multifunctional.

80. Practical software binds all of Praktikal's elements together. Its TLS's consist of reusable learning objects that teachers can use, edit or create by themselves. The software can do everything from the essentials like slides to complicated solutions like tests and teachers can exchange their materials in a marketplace.

81. Benefits *Praktikal* is designed and built from the perspective of the teacher. There are too many natural sciences teachers who are in that role not by choice but need. Praktikal provides the teachers with needed knowledge and resources so that the teacher can focus on teaching and learn together with the students.

(xxi)   Schoolaby

82. Schoolaby is an Artificial Intelligence powered Learning Management System for online and offline education to manage learning process and content. Through the system , scientists, teachers and educational technologists have teamed and built a study platform, where everything one needs to provide in education is available in one place and it takes less than 30 seconds to attend school.

83. Schoolaby provides school administrators with a clear insight into the progress of teaching and learning by each individual student, class, study level and subject. Visualized reports are generated automatically and study programmes are in sync with real life.

84. Artificial Intelligence powered personal approach and digital teaching materials can be brought together in one place for teachers and students that allow them to achieve world class study results without much effort. When looking into the School by platform, you find personalized study journeys, visualized analytics, a gateway to external teaching materials and more. An Artificial Intelligence powered customized study journey can be created, using any external study materials by uploading your own or link already existing world top ranked materials from other study environments.

85. No more adventures between various environments, because they are already available in School by now. No more new passwords now and again, only one log in needed. Rubric assessment availability allows the use of grading models as needed. Automatic study results from external apps come together to one central view.

86. Schoolaby allows users to export study results and all other vital data to grades depository as it is used. Our 120 developers and over 20 years of experience in software development are there to turn dreams into solutions.

(xxii)   Speakly

88. Speakly imitates the way children learn languages naturally and holistically. It focuses on learning words in their context, whole sentences, and statistically relevant study content.

Speakly offers courses in English, Spanish, French, German, Italian, Russian, and Estonian. It also offers additional courses tailored to getting by on ones travels or speaking a language in a business setting.

89. The science Speakly is committed to advancing the field of language learning by using complex scientific approaches and providing validated research to make learning a language simple for everybody. Speakly provides the opportunity to practice real-life situations right on the phone or computer. This will give the user confidence when speaking a foreign language in his/her everyday life.

90. Speakly uses spaced repetition to push newly learned information into long-term memory in the most efficient possible way. This way, one is sure of remembering everything he has learnt. With Speakly, one will attain confident speaking skills in a mere 100 hours of study. In traditional language courses, it would take years. Speakly gives one full control over where, when, and for how long you study.

91. Speakly is at least 10 times more affordable than any language class. For the cost of just one tutoring session, a user will receive several months of studies with Speakly. Speakly csan be used on the computer and smartphone and has many advantages compared to traditional language learning.

(xxiii) SpeakTX

92. SpeakTX (in Estonia: Koneravi.ee) is an online platform with exercises for anyone seeking to improve their speech. The exercises have been designed by experienced speech and language therapists for both children and adults. Exercises can be done either in collaboration with a specialist (a speech and language therapist or a teacher) or independently, together with parents.

93. For Children, SpeakTX contains more than 150 exercises, which are made up of several thousand individual tasks and most of which are designed for children. The exercises are interactive, contain lots of sounds and images, and are visually and functionally diverse, making the therapy experience interesting and engaging. SpeakTX provides great flexibility as the exercises can be done in the chosen place at the chosen time.

94. For Specialists, SpeakTX enables them to create a personalised exercise plan for each child to help them reach their individual therapeutic goals. After the completion of an exercise, results are shown that help them monitor progress and identify areas of improvement. The specialists can also create their own exercises, using various templates, and even modify the existing exercises to suit their needs.

95. SpeakTX is currently being used in more than 400 kindergartens, schools and hospitals in Estonia and benefits include-

   a. The digital and interactive exercises of SpeakTX are much more attractive for children than traditional speech and language therapy exercises.
   b. Exercises are done significantly more often. The number of repetitions increases and skills attach faster. This helps reduce the total length of therapy.
   c. Provides an opportunity to engage more children.
   d. Helps save costs for everyone.

96. SpeakTX contains a wide range of digital exercises, which children can do safely at a distance while still being under the supervision of the specialist. Thus, it has become an invaluable tool for many educational institutions in the COVID era.

(xxiv) Taut

97. Taut combines all of the essential tools for modern classrooms which include communication, whiteboard, assignments, materials, school radio, and much more. It means less time spent struggling with learning and setting up different apps, and more time for teaching and learning.

98. Classroom discussions structure community and classroom talks in topics and send private messages. Private messages can be controlled by school administration, manage assignments create, assign and give feedback to different kinds of student work through text, video, photo, whiteboard drawing, and more. Live classes with whiteboard Start live classes, create breakout rooms, and use Taut whiteboard when explaining concepts. It's perfect for remote and hybrid learning.

(xxv) Triumf health

99. Triumf Health has developed an evidence-based digital therapeutics platform for children to deliver personalized psychological support through a game environment. It started from chronic illnesses and the mental burden related to disease management but has significantly expanded the platform in response to the coronavirus pandemic. Now, the mobile platform is also supporting children without health issues who are experiencing environmental stress (currently due to the coronavirus crisis).

100. Award-winning mobile health platform engages children through a fun storyline of saving the Triumf land city from the Disease Monster. Through interactive daily tasks and missions, children aged 7-14 are learning about health and wellbeing, which is necessary to induce positive behavioral change.

101. Based on the research findings, this mobile health platform can improve children's mental well-being and quality of life while boosting their engagement. The platform is divided into two products: therapeutic Triumf Hero for children with health issues and educational Triumfland Saga for all children in the middle childhood age group.

102. Triumf land Saga offers knowledge, skills and support. In the educational health game, Triumf offers children knowledge on their health and wellbeing in an age-appropriate way. Pupils can not only learn all about healthy eating and physical activity, but also how to cope with stress and regulate emotions. Children apply the new knowledge in the interactive and fun gameplay through activity-based learning. By helping the citizens of Triumf land, they apply problem-solving skills, identify emotions, and help other children live healthily.

103. The personalized game supports children's mental health and offers external support to induce internal motivation. Psychological support is provided based on the strengths and difficulties of the child. The game is available in various languages. Localization and adaptation to any language takes 2 months.

(xxvi) Tutor. Id

104. Tutor.id is a growing online teaching platform that matches students with private tutors using Al. Tutor.id is more than a marketplace. The application provides tutors with advanced management tools on a freemium subscription model to help automate their business and teaching operations so that they can focus on their students, the quality of their teaching, and their own professional development.

105. Tutor.id is the only online tutoring marketplace that uses artificial intelligence to match tutors and students and is also a "one-stop-shop" of business and operations management tools, including: advanced calendar and scheduling, full payment, personal marketing, lessons, materials, and student acquisition. The application's freemium subscription model allow users to retain competitive commission fees from marketplace purchases.

106. Tutor.id has 5,985 tutors from across 113 countries including those from Harvard, NYU & MIT with a 98% student satisfaction. The platform is marketing primarily to established online and offline tutors to join it and purchase a subscription plan. The platform will also incentivize these tutors to invite and manage their own current students. The application's data shows that one experienced and established tutor invites, on average, 10-25 students. In this way, users will build a strong supply of qualified and experienced tutors for our marketplace as well as initial student demand.

107. The platform has nearly 400 Tutor.id team-approved subjects ranging from school subjects of various national curriculums to soft skills or unusual subjects as Canine Behavior, Neurocognitive Development and Podcasting for Beginners. While registering on Tutor.id platform is free, the over 2,500 registered students on the platform only pay for purchased lessons. Tutor.id keeps a 15% fee per lessons or package of lessons booked. It offers tutors a $10 monthly Lite Plan or $40 Premium Plan subscriptions.

(xxvii) Vivita

108. *Vivita* has no teachers and no formal curriculum. The activities are driven by children themselves, and adults play a supportive and inspiring role in this journey. It is believe this will increase their confidence and help them grow into talented, smart and responsible world-changers.

109. *Vivita* provides a creative learning space called *vivistop*, equipped with modern creative tools such as 3D printers and inspirational creative stuffs such as recycled materials. It gives all the children free access to that creative learning environment, regardless of economic, social, or regional constraints.

110. *Vivita* builds open software and hardware ecosystem to enhance children's creativity. It develops modularized, scalable, easy-to-use software and hardware toolset called *viviware* for rapid prototyping with less programming, and provide unified open data platform called *vivita* Account to manage their creative work for further collaborations.

111. A global community of creative children and supporters, *vivita* is a community that transforms children's inspirations into real skills. The platform supports them to make their idea into reality by taking advantage of global expert's network. Through those activities,

the platform gives children 'sense of no limit' to foster their creativity so that they can grow well as great creators or innovators to change the world better.

(xxviii) Dream Apply

112.   Dream Apply is a student admissions management system designed with and for educational institutions. With its modular approach, institutions can tailor how Dream Apply works for them while improving the student experience.

113.   Dream Apply's application management system features all that institutions need for their admissions, marketing, recruitment, and financial aid processing needs. Dream Apply can easily be integrated with many popular tools that support institutions in further streamlining the application process.

114.   Dream Apply has a proven RESTful API that can be used to develop custom integration flows into other solutions, including any proprietary systems that institutions may be using.

Benefits

115.   Dream Apply benefits include-

(i)   Results-focused

116.   Dream Apply boosts efficiency and productivity of admissions teams by directly addressing and eliminating pain points in workflows, delivering streamlined processes and easy-to-use digital solutions for all parties involved, such as applicants, education partners and of course, staff at institution.

116.   Dream Apply clients experience an average of a 75% increase in applicants over three years. The longer institutions work with the platform, the better the success rates get.

(ii) Actively supportive

117.   In an increasingly competitive landscape for international education, Dream Apply choose to invest and develop technological solutions driven by its clients' needs as well as emerging trends, with 70% of incremental innovation projects at Dream Apply coming directly from clients' feedback.

118.   Dream Apply tailors solutions to fit its clients' reality. Providing training and unrivalled support are essential services Dream Apply provides to its clients who have dedicated account and project managers.

Features

119.   Dream Apply features include-

(i) Applications

120.   It's a single hub for managing, evaluating, ranking and sharing online applications, creating a smooth admissions experience while increasing the conversion rate of applications and ensuring a positive first impression for applicants.

(ii) Scholarship

121. Enables users to create and manage schedules of how scholarships are allocated from budgets set, so that users don't overspend and award only those that deserve it while keeping it transparent.

(iii) Content

122. With Dream Apply's easy-to-use interface, it is simple to publish news, events, advice and tutorials, requiring no special skills to do so.

(iv) Marketing

123. Integrations, detailed analytics and reporting allows users to allocate a marketing bud-get to attain the best ROI, by understanding what activities attract students to best inform future investment and support users in meeting their admissions targets.

(v) Study advisors

124. Dream Apply enables users build trust through transparency, by allowing agents to enter their students directly into the system, using built-in reports to analyze their performance.

(vi) Developer tools

125. Dream Apply enables users migrate information to other software or build tailored scripts to process and visualize their data, seamlessly while integrating Dream Apply into current processes.

(vii) Finances

126. Integrated online payment gateways allow clients to easily track and control payments while helping to consolidate tasks between admissions and finance teams.

(viii) Automation

127. Dream Apply enables clients to automate tasks to eliminate tedious, repetitive and time-consuming tasks. It carries them out automatically while users are able to do other meaningful work without interruption.

(ix) GDPR and security

128. Dream Apply enables users keep track of legal and security requirements as it mitigates the need to hire a team of professionals to keep data secure and GDPR compliant.

Numbers

129. Dream Apply admission software is used in more than 300 education institutions in Estonia, 40 countries worldwide and processes over 500000 applications per year. It has proved to be a solution that empowers user internationalization strategy and student recruitment goals. It has positively impacted the student experience through the use of a solution that meets the needs of the modern applicant.

130. Dream Apply has consolidated admissions and scholarship applications into one system with accurate visibility to easily track, award, and inform applicants. It has seen greater productivity with a 60% decrease in administrative workload.

Case study

Budapest Metropolitan University

131. The University used to work with Excel files and a Lot of papers. To make a comparison. Adopting Dream Apply has been like coming from the middle ages to the 21st century. The Dream Apply Client Happiness Team has always been quick with responses. On average, the University gets answers within a few hours if there are any questions.

132. In addition to student satisfaction, it is essential that training new colleagues to adopt the platform is easy and as the platform is so user-friendly - new staff members can comfortably handle the platform in just a couple of days. From an applications management perspective, the University can track all its applicants' journeys, starting from understanding the source, i.e., agents or marketing channels.

133. The University via their track record is also able to quickly reject applicants, who have been trying to apply for years without fulfilling the entry qualifications. Furthermore, an essential factor is having a variety of reports available as an overview of the University's admissions data to quickly make data-driven decisions for future growth.

(xxx) The Estonian Briefing Centre

134. The e-Estonia Briefing Centre was designed specifically for experiencing everything e-Estonia has to offer. The Centre was stablished in 2009 as a Non-Governmental Organization, it is today part of the Estonian Business and Innovation Agency and plays an integral role in promoting the country's know-how and expertise in digital services.

135. The Centre presents visitors with the e-Estonia concept, lessons learned and challenges, as well as the future of our digital state, and act as coordinators between G2G, B2G, and B2B relations. The Centre has also hosted global political leaders such as presidents, ministers, high-level decision-makers from the public and private sector, investors, and international media keen to learn more about e-Estonia. The Centre frequently assists and consults other countries with digitalization initiatives and match them with credible, leading Information Technology partners to empower their efforts, as well as boost innovation and international cooperation.

136. The Centre was established to promote the building of a successful Estonia through the long term strategic goals of the Estonian Economy and further to facilitate the process of Estonia becoming one the most economically competitive countries in the world. This is to be facilitated through-

(i)   Introducing opportunities for bringing Estonian companies to a new level through business model innovation

(ii)   Sharing expert know-how and connecting Estonian Companies with the right partners for business development

(iii)   Supporting Estonian Company ambitious ideas as well as assisting in finding international funding opportunities.

(xxix) Mondo Organization

137.   Mondo is an Estonia Non-Governmental Organization working towards alleviating global inequality. The word "Mondo" is in Esperanto and refers to a more equal future. The Organization was established in 2007 and has been operating in Kenya since 2010. The organization also operates in 12 other countries namely; Afghanistan, Burma, Georgia, Ghana, Syria, Jordan, Kenya, Lebanon, Turkey, Uganda, Ukraine and Yemen

138.   The Organization is supporting children's education through private donors in Kenya, Uganda, Ghana, Burma and Turkey. In Kenya, the Organization is running projects in Nairobi, Shianda in Kakamega County and Kakuma in Turkana County.

139.   With the help of private donors Mondo supports students' education and teachers training. There are currently 92 elementary and high school students benefiting from the school program. Separately, the organization supports 29 children with special needs. Supported students attend public schools and many high school students live in boarding schools. The Organization has sponsored training of 349 teachers in the country.

PART 4

OBSERVATIONS AND FINDINGS

140. Following the benchmarking, the Committee made the following observations and findings-

   (i)   Whilst Estonia as a country has a small budget country compared to other countries, transparency, accountability and effective utilization of the little resources available had seen the country record remarkable economic growth;

   (ii)   Education in Estonia is fully funded by the Government for those attending Government schools. All students have a medical insurance cover paid for by the Government. Among the medical services provided under the insurance cover are psycho social support and speech therapy;

   (iii)   Estonia is very advanced in digital transformation and many countries including European countries visit the country for benchmarking;

   (iv)   All Schools in Estonia are internet connected with high internet speed. The wifi network for teachers is different from that of students. All students have access to computers and smart phones for the school learning purposes;

   (v)   There are many Estonian developed digital learning applications and platforms in use in the country and worldwide. They included Alpha Kids, Bizplay, Clanbeat and Edumus. The worldwide known Bolt taxi application is Estonian developed.

   (vi)   There are also learning robots in Estonia for preschool students;

   (vii)   Students in Estonia access books and other reading materials digitally from service providers at a minimal fee paid by the Government;

   (viii) The visit to Kenya by the Estonian President in the year 2021 strengthened the relations between Kenya and Estonia. Estonia was set to open its second Embassy in Africa in Kenya in 2023, the first Embassy having been established in Egypt.

   (ix)   Presence of a Kenyan Embassy in Tallin, Estonia would fast-track strengthening of relationship between Estonia and Kenya. Currently, Estonian's seeking diplomatic services from Kenya are served by Stockholm, Sweden which is many miles far.

   (x)   To enhance relationship between Kenya and Estonia, the formation of a Kenya/Estonia Parliamentary Friendship Group would be necessary;

   (xi)   There are studying opportunities in Estonia especially in information technology in which Estonia had recorded tremendous success. A number of foreigners including Kenyans were already studying in Estonia on scholarships.

(xii)   Kenya is Estonia's largest partner in Africa in digital transformation with over twenty (20) projects under implementation by the two countries. In the education sector, Estonia was working closely with the Kenya Institute of Curriculum Development towards digital transformation in curriculum development and digital skilling.

(xiii)   There were more projects in the offing for Kenya from Estonia. Government officials were to visit Kenya in mid May 2023 to meet Ministry of Education, Information and Communication as well as Health Officials with a view to signing Memorandum of Understanding on new projects.

PART 5

RECOMMENDATIONS

141.   Based on the Committee observations and findings, the Committee recommends as follows-

    (i)   The Ministry of Education should take necessary action to ensure ICT infrastructure is developed in Kenya and digital learning administered in all schools countrywide;

    (ii)   The Ministry of Education should take necessary action to ensure all Kenyan children are able to access education from Primary School to University for free;

    (iii)   The Ministry of Education should take necessary action to ensure all students have access to digital learning materials as opposed to physical books which are bulky to carry and wear out fast through daily usage;

    (iv)   The Ministry of Foreign and Diaspora Affairs should fast-track Estonia's setting up of an Embassy in Nairobi and also consider setting up a Kenyan embassy in Estonia in order to enhance relations between the two countries.

    (v)   The National Assembly should initiate the formation of a Kenya/Estonia Parliamentary Friendship Group to enhance relations between the two countries.

    (vi)   Kenyans students should apply for educational scholarships in Estonia to benefit from the available opportunities in the country.

Signed... Date.........8/8/2023.............

Hon. Julius Melly, M.P.
Chairperson, Departmental Committee on Education