The Smart Classroom concept was originally designed for 10 TVET institutes for the Ministry of Education in Kenya. While studying their TVET education system it became clear that there was a big gap between theory and practical skills of the teachers and students. The conclusion was that by means of the use of Smart Classrooms with an emphasis on experiments, investigations and virtual learning, the teacher and students are better prepared to use practical training equipment.

It also maximizes the use of the existing equipment at the workshops, amongst others, through:

- Presentations
- Digital lessons
- Investigations
- On-screen simulations
- Virtual experiments
- Practical exercises
- Project and group work

Smart Classroom for TVET includes the following components:

- Project design
- Site-surveys and recommendations
- Creation of a virtual learning environment
- Digital learning Resources Library
- Small scale practical items
- Digitizing emerging technologies
- Integration of ICT based learning in TVET
- Establish IT infrastructure
- Supply, installation and commissioning of equipment
- Training of teachers and IT Classroom managers
- Long term technical support, training and maintenance

In general Smart Classrooms are often considered as classrooms with a focus on ICT hardware and software and in particular the use of so-called “Smart Boards” and other audio/visual equipment. These have now been introduced widely in Africa from Primary to Higher Education level. However the Devotra Smart Classroom concept goes much further than the traditional interpretation of a Smart Classroom and actually brings 21st century education systems to Africa. The Devotra Smart Classroom concept is available for: Primary Education, Secondary Education, Higher Education and TVET.

Some Smart Classroom workstation examples

<table>
<thead>
<tr>
<th>RENEWABLE ENERGY</th>
<th>MACHINE TOOLS &amp; CNC</th>
<th>CNC SIMULATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATERIALS &amp; PROCESSES</td>
<td>INDUSTRIAL CONTROLS</td>
<td>HYDRAULICS</td>
</tr>
<tr>
<td>AUTOMOTIVE</td>
<td>3D/2D DESIGN SOFTWARE</td>
<td>PNEUMATICS</td>
</tr>
</tbody>
</table>

The Smart Classroom concept can be used as an incubator area for ideas based on industry and labour market requirements. It will change students and teachers mind-sets and will bring innovation, spur creative and catalytic thinking, triggers students’ exploration skills, enhance problem-solving based learning and provide the opportunity to teach and learn design, programming, engineering and production skills.

DEVOTRA Smart Classrooms for
Primary Education
Secondary Education
Higher Education
TVET

Devotra B.V.
Energieweg 2 | 4691 SG Tholen | The Netherlands
P.O. box 18 | 4690 AA | The Netherlands
Tel.: +31 166 609 500 | Fax: +31 166 609 509
export@devotra.nl | www.devotra.nl | www.smartclassroom.nl

In general Smart Classrooms are often considered as classrooms with a focus on ICT hardware and software and in particular the use of so-called “Smart Boards” and other audio/visual equipment. These have now been introduced widely in Africa from Primary to Higher Education level. However the Devotra Smart Classroom concept goes much further than the traditional interpretation of a Smart Classroom and actually brings 21st century education systems to Africa. The Devotra Smart Classroom concept is available for: Primary Education, Secondary Education, Higher Education and TVET.

The Smart Classroom concept can be used as an incubator area for ideas based on industry and labour market requirements. It will change students and teachers mind-sets and will bring innovation, spur creative and catalytic thinking, triggers students’ exploration skills, enhance problem-solving based learning and provide the opportunity to teach and learn design, programming, engineering and production skills.

The Smart Classroom concept seamlessly integrates the following components:

- Digital Resources Library with 8,500 ready-made learning units
- Practical demos and training units linked to the Digital Resources Library
- Virtual environments for exploration, investigation, on-screen simulations, virtual experiments and presentations
- Top quality ergonomic designed furniture to create a modern learning environment
- Long term technical support, training and after-sales
- A offline and/or online future proof solution available via a suitable E-learning platform
- Mapping to the existing local curriculum

Smart Classrooms will act as an incubator area for ideas based on industry and labour market requirements. It will change students and teachers mind-sets and will bring innovation, spur creative and catalytic thinking, triggers students’ exploration skills, enhance problem-solving based learning and provide the opportunity to teach and learn design, programming, engineering and production skills.
Secondary Education

The Smart Classroom active learning program is composed of creative hands-on tasks and interactive virtual software applications that work together seamlessly. These activities encourage children to explore scenarios by themselves, and then explain to you what they have learned about STEM.

The Devotra Smart Classroom concept for Primary Education programs seamlessly integrates the following components:

- Digital Resources Library with over 1000 lessons
- Including 300 teaching inquiry-based digital investigations and simulations
- Practical demo and training units linked to the Digital Resources Library
- State-of-the-art ICT laboratory for exploration, investigation, resource simulations, virtual experiments and presentations
- Top quality ergonomic designed furniture to create a modern and inspiring learning environment
- Long term technical support, training and after-sales
- A future proof solution that is available offline and/or online via a suitable E-learning platform
- Mappings to the local Primary Education Curriculum

The typical STEM lab configuration includes the following resources:
- Life science
- Earth Science
- Physical Science
- Math
- Science practices
- Engineering
- Hardware kits

This Smart Classroom Concept can be designed to meet the needs of STEM (Science, Technology, Engineering, Mathematics) programs. The Digital STEM Library space provides students with a wide range of educational experiences that integrate science, technology, engineering and mathematics. Modern technologies are featured here, with an emphasis on science. Using the Smart Classroom will encourage better results in a wide range of Level 2 STEM subjects, including GCSE Mathematics and Science.

The typical STEM lab configuration includes the following resources:
- Science practices
- Math
- Mathematics
- Life science
- Earth science
- Physics
- Engineering
- Hardware kits

The Smart Classroom Concept can be designed to meet the needs of HE STEM programs. The Digital Resources Library with over 3000 lessons and simulations includes an interactive training platform. The resources are available offline and/or online via a suitable E-learning platform. Mappings to the local Higher Education Curriculum have been made.

The typical STEM lab configuration includes the following resources:
- Numerical Technology
- Engineering design
- Architectural technology
- Construction engineering
- Design engineering
- Machine technology
- Mechatronics
- Manufacturing technology
- Mass transportation
- Industrial robotics
- Electronics technology
- Transportation technology

Higher Education STEM programs

This specific Devotra Smart Classroom concept for HE STEM programs seamlessly integrates the following components:

- Digital Resources Library with 4,700 ready-made lesson modules, teaching, learning units covering Level 1 to 5 engineering qualifications
- Practical demo and training units linked to the Digital Resource Library
- Includes ICT laboratory for exploration, investigation, resource simulations, virtual experiments and presentations
- Top quality ergonomic designed furniture to create a modern and inspiring learning environment
- Long term technical support, training and after-sales
- A future proof solution that is available offline and/or online via a suitable E-learning platform
- Mappings to the local Higher Education Curriculum

The SMART CLASSROOM CONCEPT FOR HIGHER EDUCATION CAN INCLUDE THE FOLLOWING ROOMS:

Teacher led presentation rooms

- Based on maximum 25 students
- Direct access to Digital Library server for teachers
- Teacher can present lessons to students by means of presentations
- 16 workstations direct access to Digital Library server
- Practical units linked to the Digital Resources Library
- Focus on: Mechanical & Fluid Power, Rapid Prototyping/Industrial Manufacturing, Laser cutting/engraving, 3D scanning, 3D printing, CNC machining, CNC manufacturing, Machine tools

Student explor and investigation rooms

- Based on maximum 32 students
- 16 workstations direct access to Digital Library server for students
- Practical units linked to the Digital Resources Library
- Focus on: Mechanical & Fluid Power, Rapid Prototyping/Industrial Manufacturing, Laser cutting/engraving, 3D scanning, 3D printing, CNC machining, CNC manufacturing, Machine tools
The Devotra Smart Classroom concept for Primary Education resources: The typical STEM lab configuration includes the following resources: Life science; Earth Sciences; Physical Science; Mathematics; Science practices; Engineering; Hardware Kits.

The Smart Classroom active learning program is composed of creative hands-on tasks and interactive virtual software applications that work together seamlessly. These activities encourage children to explore scenarios by themselves, and then explain to you what they have learned about STEM.

The Devotra Smart Classroom concept for Secondary Education programs seamlessly integrates the following components: Digital Resources Library with over 1000 lessons; including 300 reading/enquiry-based digital investigations and simulations; Practical demo and training units linked to the Digital Resources Library; State-of-the-art ICT laboratory for exploration, investigation, demonstrations, virtual experiments and presentations; Top quality ergonomic designed furniture to create a modern and inspiring learning environment; Long term technical support, training and after-sales; A future proof solution that is available offline and/or online via a suitable e-learning platform; Mappings to the local Primary Education Curriculum; and inspiring learning environment.

The Devotra Smart Classroom concept for Secondary Education programs seamlessly integrates the following components: Digital Resources Library with over 3000 lessons; Practical demo and training units linked to the Digital Resources Library; State-of-the-art ICT laboratory for exploration, investigation, demonstrations, virtual experiments and presentations; Top quality ergonomic designed furniture to create a modern and inspiring learning environment; Long term technical support, training and after-sales; A future proof solution that is available offline and/or online via a suitable e-learning platform; Mappings to the local Secondary Education Curriculum; and inspiring learning environment.

The Devotra Smart Classroom concept for Higher Education STEM programs seamlessly integrates the following components: Digital Resources Library with 4,700 ready-made engineering learning units covering Level 1 to 5 engineering qualifications; Practical demo and training units linked to the Digital Resources Library; State-of-the-art ICT laboratory for exploration, investigation, demonstrations, virtual experiments and presentations; Mappings to the local Higher Education Curriculum; and inspiring learning environment.

The typical STEM lab configuration includes the following resources: Biomedical Technology; Manufacturing technology; Industrial manufacturing; Industrial design; Automation; Engineering design; Research, Design & Technology; Electronics; Computer programming; Automation Engineering; Mechanical engineering; Mechatronics; Manufacturing technology; Mass transportation; Industrial robotics; Electronics technology; Transportation technology.

The typical STEM lab configuration includes the following resources: Computer programming; Engineering design; Architectural technology; Construction engineering; Engineering design; Mechanical robotics; Mechatronics; Manufacturing technology; Mass transportation; Industrial robotics; Electronics technology; Transportation technology.

The typical STEM lab configuration includes the following resources: Health care; Engineering; Design & Technology; Electronics; Computer programming; Automation Engineering; Mechanical engineering; Mechatronics; Manufacturing technology; Mass transportation; Industrial robotics; Electronics technology; Transportation technology.

The typical STEM lab configuration includes the following resources: Biomedical Technology; Manufacturing technology; Industrial manufacturing; Industrial design; Automation; Engineering design; Research, Design & Technology; Electronics; Computer programming; Automation Engineering; Mechanical engineering; Mechatronics; Manufacturing technology; Mass transportation; Industrial robotics; Electronics technology; Transportation technology.

This specific Devotra Smart Classroom concept for Higher Education STEM programs seamlessly integrates the following components: Digital Resources Library with 4,700 ready-made engineering learning units covering Level 1 to 5 engineering qualifications; Practical demo and training units linked to the Digital Resources Library; State-of-the-art ICT laboratory for exploration, investigation, demonstrations, virtual experiments and presentations; Mappings to the local Higher Education Curriculum; and inspiring learning environment.

The Smart Classroom Concept can be designed to fit around the local ICT in Higher Education Initiative and the mix of Smart Classrooms for Higher Education STEM (Science, Technology, Engineering, and Mathematics) programs.
The Devotra Smart Classroom concept for Primary Education programs seamlessly integrates the following components:
- Digital Resources Library with over 1000 lessons
- Hardware Kits
- Science practices
- Mathematics
- Science
- Practical demo and training units linked to the Digital Resources Library
- State-of-the-art ICT laboratory for exploration, investigation, science simulations, virtual experiments and presentations
- Teacher led presentation rooms
- Teacher can present lessons to students by means of presentations
- 16 workstations direct access to Digital Library server
- Direct access to Digital Library server for teachers
- Top quality ergonomic designed furniture to create a modern and inspiring learning environment
- Long-term technical support, training and after-sales
- A future proof solution that is available offline and/or online via a suitable E-learning platform
- Mapping to the local Primary Education Curriculum

The Devotra Smart Classroom concept for Secondary Education programs seamlessly integrates the following components:
- Digital Resources Library with over 3000 lessons
- Hardware Kits
- Science practices
- Mathematics
- Science
- Practical demo and training units linked to the Digital Resources Library
- State-of-the-art ICT laboratory for exploration, investigation, science simulations, virtual experiments and presentations
- Teacher led presentation rooms
- Teacher can present lessons to students by means of presentations
- 16 workstations direct access to Digital Library server
- Direct access to Digital Library server for teachers
- Top quality ergonomic designed furniture to create a modern and inspiring learning environment
- Long-term technical support, training and after-sales
- A future proof solution that is available offline and/or online via a suitable E-learning platform
- Mapping to the local Secondary Education Curriculum

This specific Devotra Smart Classroom concept for Higher Education STEM programs seamlessly integrates the following components:
- Digital Resources Library with a 750+ ready-made engineering learning units covering Level 1 to 5
- Engineering qualifications
- Practical demo and training units linked to the Digital Resources Library
- Industrial manufacturing, research and learn units linked to the Digital Resources Library
- Top quality ergonomic designed furniture to create a modern and inspiring learning environment
- Long-term technical support, training and after-sales
- A future proof solution that is available offline and/or online via a suitable E-learning platform
- Mapping to the local Higher Education Curriculum

The Smart Classroom Concept for Higher Education Can include the following rooms:
- Teacher led presentation rooms
- Based on maximum 32 students
- Direct access to Digital Library server for teachers
- Teacher can present lessons to students by means of presentations
- 16 workstations direct access to Digital Library server
- Top quality ergonomic designed furniture to create a modern and inspiring learning environment
- Long-term technical support, training and after-sales
- A future proof solution that is available offline and/or online via a suitable E-learning platform
- Mapping to the local Higher Education Curriculum

The hands-on digital project based learning model requires engineering, math and language skills in primary school children.

The Smart Classroom active learning program is composed of creative hands-on tasks and interactive virtual software applications that work together fluently. These activities encourage children to explore scenarios by themselves, and then explain to you what they have learned about STEM.

The Smart Classroom Concept for Secondary Education is designed to encourage better results in a wide range of Level 2 STEM subjects, including GCSE Mathematics and Science.

Science, technology, engineering and mathematics. Modern technologies are facilitated here, with an emphasis on science. Using the Smart Classroom will encourage better results in a wide range of Level 2 STEM subjects, including GCSE Mathematics and Science.

The Devotra Smart Classroom active learning program is composed of creative hands-on tasks and interactive virtual software applications that work together flawlessly. These activities encourage children to explore scenarios by themselves, and then explain to you what they have learned about STEM.
Technical Vocational Education and Training (TVET)

Introducing a unique TVET teaching and learning concept, combining state-of-the-art technologies, software, simulations, experiments and hands-on practical education, for a future-proof environment.

The Smart Classroom concept was originally designed for 10 TVET institutes for the Ministry of Education in Kenya. While studying their TVET education system it became clear that there was a big gap between theory and practical skills of the teachers and students. The conclusion was that by means of the use of Smart Classrooms with an emphasis on experiments, investigations and virtual learning, the teacher and students are better prepared to use practical training equipment.

Now the Smart Classroom provides a world-class learning facility without any equivalents in the world. The Smart Classroom introduces a unique TVET teaching and learning concept, combining state-of-the-art technologies, software, simulations, experiments and hands-on practical education, making the each TVET institute future-proof.

Smart Classroom for TVET includes the following components:
- Project design
- Site surveys and recommendations
- Creation of a virtual learning environment
- Digital learning Resources Library
- Small scale practical units
- BRICBITM emerging technologies
- Integration of ICT based learning in TVET
- Establish IT infrastructure
- Supply, installation and commissioning of equipment
- Training of teachers and IT Classroom managers
- Long-term technical support, training and maintenance

Smart Classrooms are often considered as classrooms with a focus on ICT hardware and software and in particular the use of so-called “Smart Boards” and other audio/visual equipment. These have now been introduced widely in Africa from Primary to Higher Education level. However the Devotra Smart Classroom concept goes much further than the traditional interpretation of a Smart Classroom and actually brings 21st century education systems to Africa. The Devotra Smart Classroom concept is available for Primary Education, Secondary Education, Higher Education and TVET.

In general Smart Classrooms are often considered as classrooms with a focus on ICT hardware and software and in particular the use of so-called “Smart Boards” and other audio/visual equipment. These have now been introduced widely in Africa from Primary to Higher Education level. However the Devotra Smart Classroom concept goes much further than the traditional interpretation of a Smart Classroom and actually brings 21st century education systems to Africa. The Devotra Smart Classroom concept is available for Primary Education, Secondary Education, Higher Education and TVET.

Some Smart Classroom workstation examples

- RENEWABLE ENERGY
- MACHINE TOOLS & CNC
- INDUSTRIAL CONTROLS
- HYDRAULICS
- MATERIALS & PROCESSES
- AUTOMOTIVE
- 2D/3D DESIGN SOFTWARE
- PNEUMATICS

The Smart Classroom will act as an incubator area for ideas based on industry and labour market requirements. It will change students and teachers’ mind-sets and will bring innovation, spur creative and catalytic thinking, triggers students’ exploration skills, enhance problem-solving based learning and provide the opportunity to teach and learn design, programming, engineering and production skills.

The Smart Classroom concept was originally designed for 10 TVET institutes for the Ministry of Education in Kenya. While studying their TVET education system it became clear that there was a big gap between theory and practical skills of the teachers and students. The conclusion was that by means of the use of Smart Classrooms with an emphasis on experiments, investigations and virtual learning, the teacher and students are better prepared to use practical training equipment.

Now the Smart Classroom provides a world-class learning facility without any equivalents in the world. The Smart Classroom introduces a unique TVET teaching and learning concept, combining state-of-the-art technologies, software, simulations, experiments and hands-on practical education, making the each TVET institute future-proof.

Technical Vocational Education and Training (TVET)

In general Smart Classrooms are often considered as classrooms with a focus on ICT hardware and software and in particular the use of so-called “Smart Boards” and other audio/visual equipment. These have now been introduced widely in Africa from Primary to Higher Education level. However the Devotra Smart Classroom concept goes much further than the traditional interpretation of a Smart Classroom and actually brings 21st century education systems to Africa. The Devotra Smart Classroom concept is available for Primary Education, Secondary Education, Higher Education and TVET.

The Smart Classroom will act as an incubator area for ideas based on industry and labour market requirements. It will change students and teachers’ mind-sets and will bring innovation, spur creative and catalytic thinking, triggers students’ exploration skills, enhance problem-solving based learning and provide the opportunity to teach and learn design, programming, engineering and production skills.
In general Smart Classrooms are often considered as classrooms with a focus on ICT hardware and software and in particular the use of so called “Smart Boards” and other audio/visual equipment. These have now been introduced widely in Africa from Primary to Higher Education level. However the Devotra Smart Classroom concept goes much further than the traditional interpretation of a Smart Classroom and actually brings 21st century education systems to Africa. The Devotra Smart Classroom concept is available for: Primary Education, Secondary Education, Higher Education and TVET.

The Devotra Smart Classroom seamlessly integrates the following components:

- Digital Resources Library with 8,500 ready-made learning units
- Practical demo and training units linked to the Digital Resources Library
- State-of-the-art ICT laboratory for exploration, investigation, on-screen simulations, virtual experiments and presentations
- Top quality ergonomic designed furniture to create a modern learning environment
- Long term technical support, training and after-sales
- A offline and/or online future proof solution available via a suitable E-learning platform
- Mapping to the existing local curriculum

The Devotra Smart Classroom will act as an incubator area for ideas based on industry and labour market requirements. It will change students and teachers’ mind-sets and will bring innovation, spur creative and catalytic thinking, triggers students’ exploration skills, enhance problem-solving based learning and provide the opportunity to teach and learn design, programming, engineering and production skills.

In general Smart Classrooms are often considered as classrooms with a focus on ICT hardware and software and in particular the use of so called “Smart Boards” and other audio/visual equipment. These have now been introduced widely in Africa from Primary to Higher Education level. However the Devotra Smart Classroom concept goes much further than the traditional interpretation of a Smart Classroom and actually brings 21st century education systems to Africa. The Devotra Smart Classroom concept is available for: Primary Education, Secondary Education, Higher Education and TVET.

The Devotra Smart Classroom seamlessly integrates the following components:

- Digital Resources Library with 8,500 ready-made learning units
- Practical demo and training units linked to the Digital Resources Library
- State-of-the-art ICT laboratory for exploration, investigation, on-screen simulations, virtual experiments and presentations
- Top quality ergonomic designed furniture to create a modern learning environment
- Long term technical support, training and after-sales
- A offline and/or online future proof solution available via a suitable E-learning platform
- Mapping to the existing local curriculum

The Devotra Smart Classroom will act as an incubator area for ideas based on industry and labour market requirements. It will change students and teachers’ mind-sets and will bring innovation, spur creative and catalytic thinking, triggers students’ exploration skills, enhance problem-solving based learning and provide the opportunity to teach and learn design, programming, engineering and production skills.

In general Smart Classrooms are often considered as classrooms with a focus on ICT hardware and software and in particular the use of so called “Smart Boards” and other audio/visual equipment. These have now been introduced widely in Africa from Primary to Higher Education level. However the Devotra Smart Classroom concept goes much further than the traditional interpretation of a Smart Classroom and actually brings 21st century education systems to Africa. The Devotra Smart Classroom concept is available for: Primary Education, Secondary Education, Higher Education and TVET.

The Devotra Smart Classroom seamlessly integrates the following components:

- Digital Resources Library with 8,500 ready-made learning units
- Practical demo and training units linked to the Digital Resources Library
- State-of-the-art ICT laboratory for exploration, investigation, on-screen simulations, virtual experiments and presentations
- Top quality ergonomic designed furniture to create a modern learning environment
- Long term technical support, training and after-sales
- A offline and/or online future proof solution available via a suitable E-learning platform
- Mapping to the existing local curriculum

The Devotra Smart Classroom will act as an incubator area for ideas based on industry and labour market requirements. It will change students and teachers’ mind-sets and will bring innovation, spur creative and catalytic thinking, triggers students’ exploration skills, enhance problem-solving based learning and provide the opportunity to teach and learn design, programming, engineering and production skills.