

Chapter 5

P R O G R A M M E



SOFTWARE / OPERATING SYSTEM / ENGINE / PROGRAMMING



“Education is the great engine of personal development. It is through education that the daughter of a peasant can become a doctor, that the son of a mineworker can become the head of the mine, that a child of farmworkers can become the president of a great nation. It is what we make out of what we have, not what we are given, that separates one person from another.”

- Nelson Mandela, 1995



5 . 1 I N T R O D U C T I O N

The following section is an explanation of the programme of a T.E.L. (Technology-Enabled-Learning) Centre for the Creative Arts. It starts off highlighting the need for educational centres in the country beyond just formal schooling; thereafter it zooms in to the context of the GPW site and investigates why such a programme is necessary in that area. Following is a discussion on the future of education and what impact technology will have on it, as well as an analysis on various methods of learning and the spatial arrangements to accommodate them. Finally this chapter concludes with an explanation of a typical development scenario for such a learning centre. Various sources were consulted for this chapter, including general statistics as well as academic research studies and their implications in the built environment.

5.2 NEED FOR EDUCATION IN SOUTH AFRICA

5.3 NEED FOR ALTERNATIVE HIGHER EDUCATIONAL FACILITIES

5.4 PROMOTING CREATIVE ARTS IN THE CYBER-AGE [ESPECIALLY IN THE N-W-Q]

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5.6.1.1 TOWARDS LEARNING AS A SOCIAL PRACTICE

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5.2 NEED FOR EDUCATION IN SOUTH AFRICA

As mentioned in Chapter 1, the current unemployment rate for South Africa is 25,2% (Statssa, 2016), and that is only the recorded rate - one can speculate about the true figure being higher. This condition is a result of many underlying factors, one of them being the lack of good quality education for all spheres of society - and not only in the current era, but also in the past few generations. Economist Francis Wilson (as cited by Fiske and Ladd, 2004: 52) wrote in an essay on the legacy of apartheid:

"The destructive impact of the "Bantu Education" system wrought damage that will take decades if not generations to repair. The old pre-apartheid education system, despite its many faults, had the potential for ensuring a decent education for all South Africans during the second half of the 20th century. But the mean-spiritedness which underlay the philosophy of "Bantu education"; the inadequacy of the funds made available throughout most of the apartheid years; and the crippling effect of job-reservation and the color-bar on the acquisition of skills and experience by the majority of workers could almost have been designed to prevent them from being adequately prepared for the challenges of globalisation in the 21st century."

In light of this statement, the following generations will still be fixing the scarring of the previous political paradigm in terms of educational equality. During the last two decades, in the city of Pretoria there has been a great surge in the number of schools and various educational facilities, especially in the CBD area. The National Library of South Africa on the corner of Johannes Ramokhoase and Thabo Sehume Streets accommodates over 3000 people on a daily basis (Malan, 2016). Therefore, beyond just formal schooling, there is a greater need for public services that provide for the enrichment and further education of the people.

5.3 NEED FOR ALTERNATIVE HIGHER EDUCATIONAL FACILITIES

As noted in the introduction, universities alone are not sustainable if they are the only form of tertiary educational institutions: Poplak (2016) writes that "young South Africans desperately need higher education in order to close an inequality gap", but that they find difficulty in navigating the university system partly because "it costs so much in fees and related expenses" and also that "too many students are unprepared for university" because of inadequate primary and secondary education.

In an interview conducted with Adam Habib (Poplak, 2016) he recognises the need for (and current lack of) alternative higher educational institutions in South Africa, beyond universities, such as **vocational schools and training facilities** "to sop up students destined to fall through the gaps". While universities need to maintain high standards, according to Habib, intermediary institutions (beyond secondary schooling) are necessary for people at the lower end of the educational scale to move upwards from their existing skill-level. Therefore, in order to move towards closing the inequality gap in South Africa, alternative educational facilities, that provide learning courses beyond secondary schooling, are necessary. These alternative learning courses include vocational skills and technical training for practical trades such as carpentry, plumbing, electrician, automotive service technicians and mechanics, etc.

5.4 PROMOTING CREATIVE ARTS IN THE CYBER-AGE [ESPECIALLY IN THE N - W - Q]

This being said, (as briefly mentioned in Chapter 1), Lodder (2016) states that we stand on the brink of the *fourth industrial revolution* (see Figure 2.1) in which it is estimated that 47% of existing jobs are at risk for replacement by digital and robotic technologies in the next twenty years (Lynch, 2015). This 47% constitutes jobs that typically characterise positions in the manufacturing and services industries (Lynch, 2015). Therefore, the people who will suffer the most by *the fourth industrial revolution* are the middle- and lower-income spheres of society. The north-western quadrant is currently characterised by these spheres, especially with the new mixed-use and social housing complex (Thembelihle Village) being constructed across the road to the north-west. It is therefore of critical importance that the inhabitants of this neighbourhood be equipped with skills that will be of value not only now but also throughout future changes in the employment market.

In summary, although technical skills training is very necessary in the current condition of education and inequality in South Africa, one cannot ignore the fact that it will be largely consumed by technology in the near future, and then what occupations will these people be left with?

As pointed out in the introduction, one thing that technology will not replace (at least not for a while, according to author Ian Pearson, (2015 as cited by Muoio)) is humans' ability to think creatively, which, he says "will protect a certain subset of jobs". In a study conducted by Oxford associate professor, Michael Osborne (as cited by David, 2015), it was found "for both the UK and the US, that almost 90% of creative jobs are at low or no risk of automation". These 'creative jobs' constitute a variety of creative artisan skills, including visual art and sculpture, fashion and jewellery design, also musical training such as learning instruments and notes, etc.

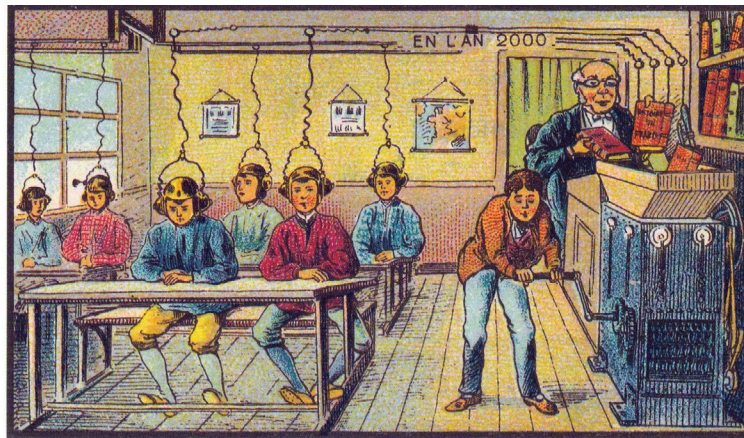
The learning programme content presented at this facility will therefore be focussed on a variety of craft skills; including vocational trade skills in response to current conditions, and also creative arts training in preparation of future conditions. It forms part of the EPWP (Expanded Public Works Programme) which will be discussed further in section 5.11. This will also have an uplifting effect on the stagnant condition of the area, which is in dire need of urban regeneration, and, as Jane Jacobs points out (1992:14), the success lies in the "most intricate and close-grained diversity of uses that give each other constant and mutual support, both economically and socially". A public learning centre will work well as a core attraction in the area to further stimulate a healthy urban neighbourhood.



v o c a t i o n a l t o c r e a t i v e s k i l l s t r a i n i n g

5.5 FUTURE OF EDUCATION

With regards to the underlying theme in this dissertation of *time and change*, it is necessary to investigate current modes of learning as well as how these will change throughout the life-span of a building.



At School

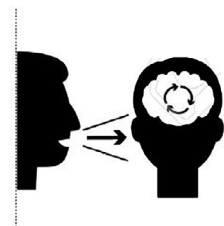
Figure 5.1: Representation of a future school by either Jean Marc Cote (in 1901) or Villemard (in 1910)

An interview was carried out with Bill Gates (Newton, 2016) and he speculated on the future of education and specifically, *personalised learning*. His own foundation has invested more than \$240 million in this field and he is confident about how technology will transform the educational system from a one-size-fits-all (thirty kids - one teacher) scenario to much more personalised learning for each student. He stated the following:

"In general, the idea is that people progress at a different rate. If you're ahead of what's being taught in the class, that's not good, you get bored. If you're behind, then they're using terms and concepts that create a general impression of "Hey, I'm not good at this." And science and math in particular — if they're talking about something you haven't had the explanation on, you just really give up in that area. And there is no way that you are brought back into it."

It is estimated that by 2019 more than 50% of educational courses will be done through 'e-learning' (electronic learning) (Laskaris, 2015). Most educational institutions are already providing electronic courses that can be completed from home without ever attending a physical class; live video streaming of lectures and the development of automatic grading software also provide online learning platforms. Beyond this, with the rise of virtual reality technology, in the coming decade (according to Gates) education will see a much greater level of interactivity between learner and (virtual) teacher. He states (Newton, 2016) that one will be able to engage in a dialogue with an AI (artificial intelligence) tutor, asking questions and advice. The beauty of this virtual teacher is that the learner will be able to go through the same lesson as many times as he wants - the virtual tutor won't get tired of repeating himself. Furthermore, the virtual learning software will be able to track a learner's progress and record information and data to come to a better understanding of where and how learners struggle (Koller, 2012).

virtual tutor



5.6 TYPES OF LEARNING:

5.6.1.1 TOWARDS LEARNING AS A SOCIAL PRACTICE

"Our institutions...are largely based on the assumption that learning is an individual process... and that it is the result of teaching...Hence we arrange classrooms where students - free from the distractions of their participation in the outside world - can pay attention to a teacher or focus on exercises...To assess learning we use tests with which students struggle in one-on-one combat... and where collaborating is considered cheating. As a result, much of our institutionalised teaching and training is perceived by would-be learners as irrelevant, and most of us come out of this treatment feeling that learning is boring and arduous, and that we are not really cut out for it.

So, what if we adopted a different perspective, one that placed learning in the context of our lived experience of participation in the world? What if we assumed that learning is as much a part of our human nature as eating or sleeping, that it is both life-sustaining and inevitable, and that - given a chance - we are quite good at it? And what if, in addition we assumed that learning is, in its essence, a fundamentally social phenomenon, reflecting our own deeply social nature as human beings capable of knowing?"

- Wenger, 1998: 3

The proliferation of personalised learning brings forth the individualised learning experience in which the learner has full control. It also conveys learning on one's own, which breeds social isolation (see Chapter 4). In opposition to this, is the social constructivism theory which maintains that learning is intrinsically a social phenomenon; and, as demonstrated by Swiss educational theorist, Étienne Wenger (1998: 5), all humans are social beings of nature, and they belong and learn in communities; he dismisses the distinctions between learning, socialising and living - saying that they are intrinsically one and the same. Wenger devised a learning model (Figure 5.2) that interconnects the concepts of community, identity, practice and meaning with the act of learning as being one inseparable process. Furthermore, Chatti et al. (2010) explains that T.E.L. (technology-enabled learning) "models thus need to recognise the social aspect of learning and put a strong emphasis on knowledge harnessing within a social context". In light of this inherent social nature of humans, the T.E.L. Centre is focused on collective, social space-making.

This is especially commendable in a heterogenous South African context to promote social interaction and cultural blending. A spatial configuration in a public learning centre can spark a spontaneous conversation between individuals from different cultures, and thereby breaching previous cultural boundaries. Learning is intrinsically a social phenomenon; and, as demonstrated by Swiss educational theorist, Étienne Wenger (1998: 5), all humans are social beings of nature, and they belong and learn in communities; he dismisses the distinctions between learning, socialising and living - saying that they are intrinsically one in the same. Wenger devised a learning model (Figure 5.2) that interconnects the concepts of community, identity, practice and meaning with the

act of learning as being one inseparable process. Furthermore, Chatti et al. (2010) explains that TEL (technology-enabled learning) “models thus need to recognise the social aspect of learning and put a strong emphasis on knowledge harnessing within a social context”. In light of this inherent social nature of humans, the digital and virtual [reality] learning arcade is focussed on collective, social space-making.



Figure 5.2: Wenger's learning model that integrates learning with community, identity, practice and meaning

5 . 6 . 1 . 2 C O M B I N I N G E D U C A T I O N A N D R E C R E A T I O N :



Malone and Lepper (1987: 223) states that “it seems a frequent assumption about schools that learning is boring and unpleasant drudgery - something one endures only to avoid punishment or to achieve some external goal” and advocates the design of ‘intrinsically motivating learning environments’. In light of this statement, this negative perception that people - not only school children, but adults as well - have of learning is impeding a lot of human potential. If one can alter the general impression of learning, the motivational issues that inhibit learning will be lessened. Therefore the purpose of the programme of the learning centre is to combine the educational function with an underlying atmosphere of recreation. Besides the blurring of physical and virtual learning spaces, the programme should therefore also include ‘pockets of play’ throughout the learning complex, for example a games arcade, social canteen space and green relaxation cavities. This provides relief from the concentration of learning and it will also alter the general perception and view from the outside of the place of ‘boring and unpleasant drudgery’ to an attraction point for fun and enjoyment.

5.6.2 PERSONALISED LEARNING [ENVIRONMENTS]

- TOWARDS SPATIAL ADJUSTABILITY -

In a study conducted by Cameron and Harrison on the *interrelatedness of formal, non-formal and informal learning, and also semi-formal learning* (see definition of terms), it was found that 84% of the respondents reported to drawing on a combined approach in terms of learning modes for learning new skills; only 16% of the self-reported skills were learnt using a single learning mode. Their report argues for a **holistic approach in terms of all the different learning modes** and its dynamic interrelatedness rather than constraining learners by a 'deterministic dichotomy between formality and informality' (Cameron & Harrison, 2012: 278). Further in support of this, Walton (2016: 145) states that 'formal' and 'informal' learning must be seen as a continuum of 'learning' rather than as contrasting modes".

Wenger asks the question of how we can "minimise teaching so as to maximise learning?" (1998: 267). This query puts the focus on the **learner to have full control over his own learning**, stimulating his own personal will for voluntary and autonomous learning. Therefore, apart from just the fixed physical spatial arrangements of learning environments that are provided to the learner, an emphasis is put on how the learner should have control over his own spatial learning arrangement.

Keppel (2014: 6) emphasises that learning spaces should "provide sufficient flexibility so that learners can re-configure the informal space to suit their own learning needs". Furthermore, Chatti et al. (2010 as cited by Fraser, 2014: 7) states that "personalised learning strategies are based on personal learning environments that 'support self-organised, informal, lifelong learning and network learning and translates the principles of constructivism and connectives into actual practice'" where 'learners are responsible for creating and maintaining their very own learning environments, self-adapted to their individual needs'.

DEFINITION OF TERMS FOR MODES OF LEARNING: (Cameron & Harrison, 2012: 280)

Formal learning: Learning through a programme of instruction in an educational institution, adult training centre or in the workplace, which is generally recognised in a qualification or a certificate.

Informal learning: Learning resulting from daily work related, family or leisure activities.

Non-formal learning: Learning through a programme but it is not usually evaluated and does not lead to certification.

Semi-formal learning: Learning in which individuals, 'may learn during activities with learning objectives but they learn beyond the learning objectives; this is semi-formal learning...Individuals have the intention of learning about something and, without knowing it, learn also about something else' (Verquin 2007 as cited by Cameron & Harrison, 2012: 284).

5 . 6 . 3 C I T Y A S A S C H O O L

Chatti et al. (2010: 75) notes that “knowledge is distributed and ubiquitous in nature and learning is now happening in a world without boundaries...and that T.E.L. (Technology-Enabled Learning) models need therefore to operate in a decentralized, loosely coupled, and open context.” In relation to this, an architect known for his humanist-centred educational design philosophies, Herman Hertzberger, (2008: 9) states the following:

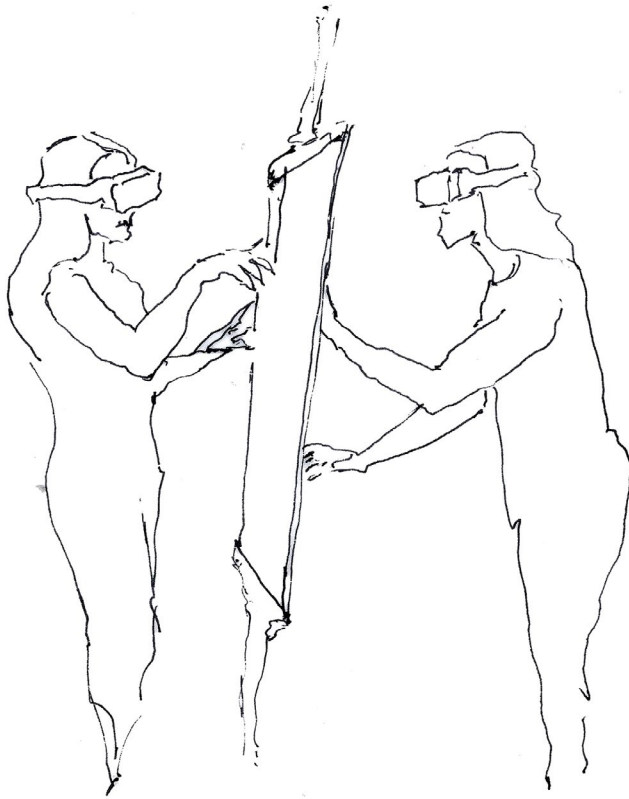
“Not only does the school become like a city; with learning expanding beyond the school curriculum it is important that our entire environment is educational. Just as continuing education is no longer confined to school hours, so with learning leaving the school territory and embracing the surroundings as a whole we can speak of ‘boundless education’. Then not only does the school become a small city but the city becomes an exceedingly large school. This is a call to make the city instructive, a ‘Learning City’, in other words a stimulating, meaningful environment that points people, especially young people, in the right direction and leaves them wiser.”

5 . 6 . 4 B L E N D I N G P H Y S I C A L & V I R T U A L L E A R N I N G S P A C E S

In the spirit of how digital technologies are taking over the educational realm, it is important for architects to take this into consideration when designing - otherwise the digital screen will just pop up wherever an economically-driven opportunity presents itself, with *Times Square* being the prime public example. Keppel (2014: 5) advocates ‘physical, blended or virtual learning environments’ or ‘areas’ that enhance learning and motivate a learner to learn, which constitutes a design approach “whereby both face-to-face and online learning are made better in the presence of each other”. In support of this van Schaik (2014: 244) notes that “briefing and procuring real and virtual environments in tandem will enliven future space use in universities”; in taking his statement further, to the city (as a school) at large (as Hertzberger pointed out), the design focus is a hybrid space that blends virtual and physical spatial arrangements that are all focused on the act of learning.

5.7 PROGRAMME :

T.E.L. [TECHNOLOGY-ENABLED-LEARNING] CENTRE

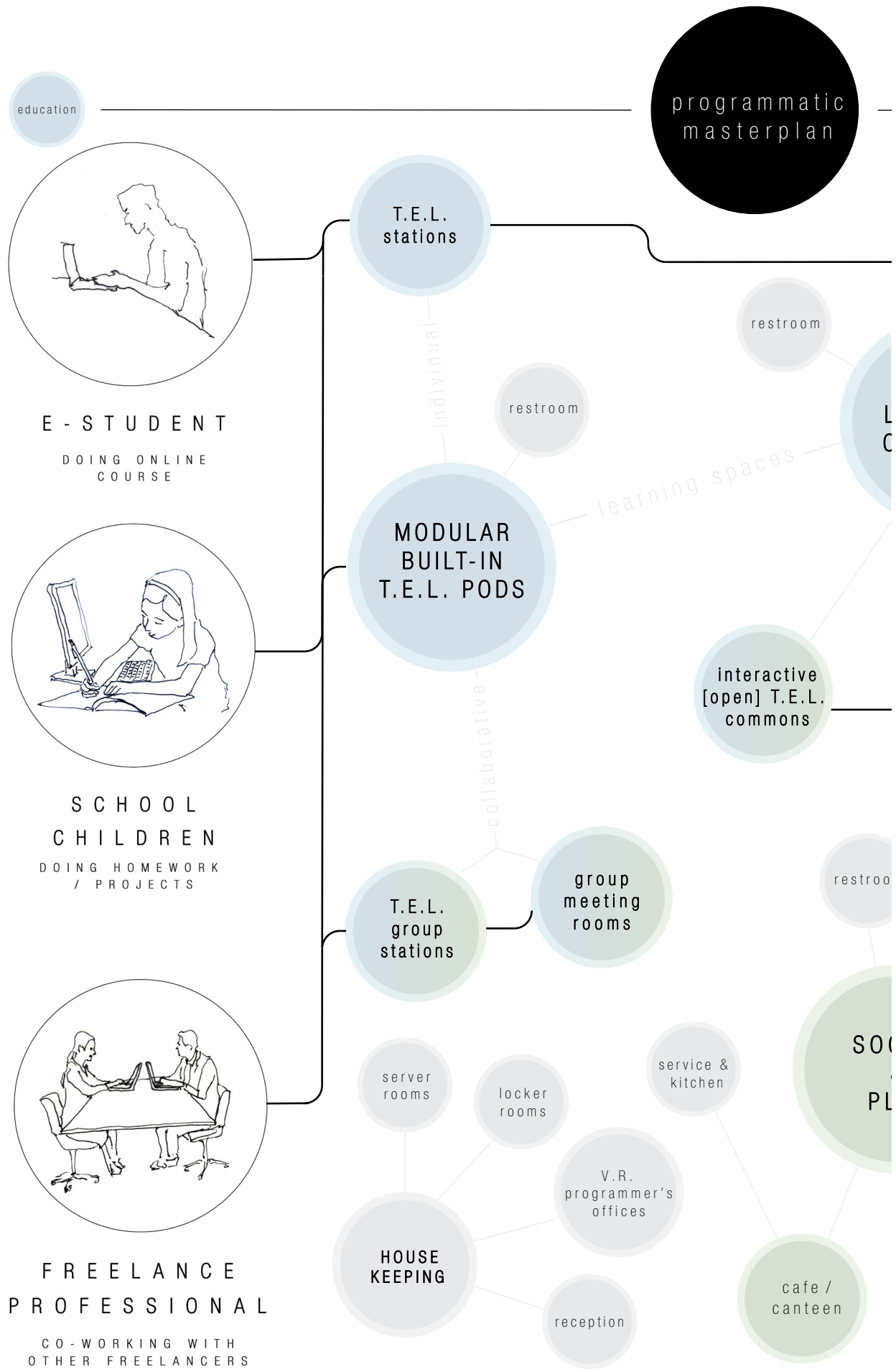


In conclusion, the programme for the new building therefore constitutes a T.E.L. [Technology-Enabled-Learning] Centre that is focused on absolute adaptability in terms of spatial arrangement, which puts the learner in full control of his learning environment; that seeks to blend the real and virtual learning spaces in a stimulating way for the learner, as well as blur the programmes of education and recreation; and which also needs to be able to absorb and adapt to changing technologies in future.

Figure 5.3 (programmatic masterplan) indicates a schedule of accommodation and proposed spaces for the T.E.L. Centre; it is indicated if the underlying programmatic intention of the function is educational (blue) or recreational (green) or a blurred combination of the two.



Additionally illustrated in this figure is the proposed typical characters that would form a part of the public clientele. Following the masterplan is an elaboration of each programmatic component with relevant case studies.



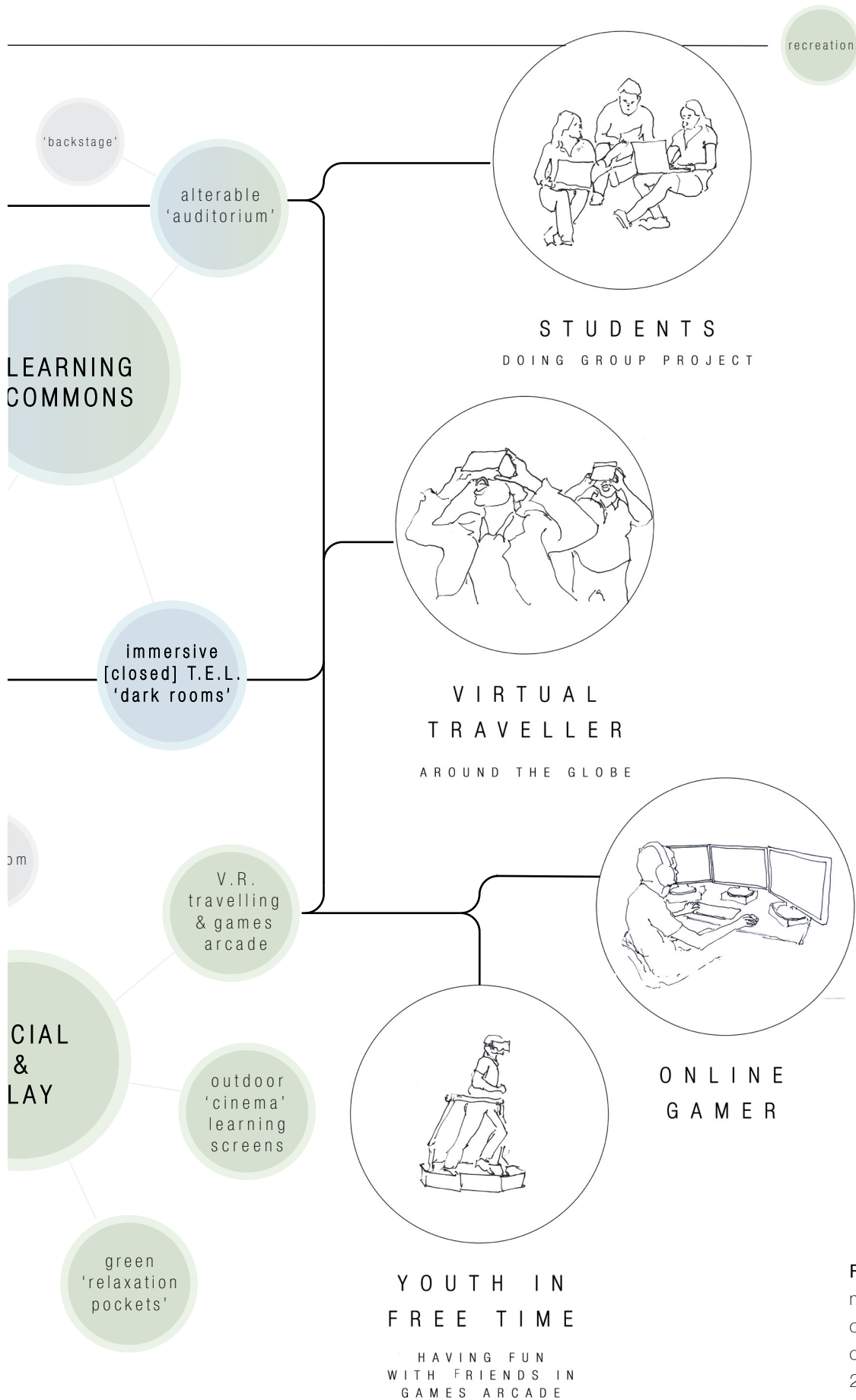


Figure 5.3: Programmatic masterplan indicating different characters and schedule of accommodation (Author, 2016)

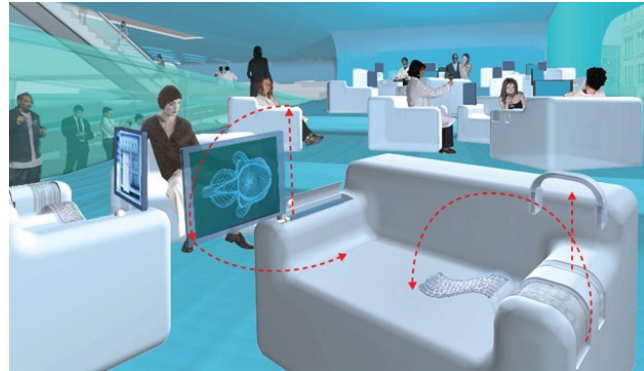
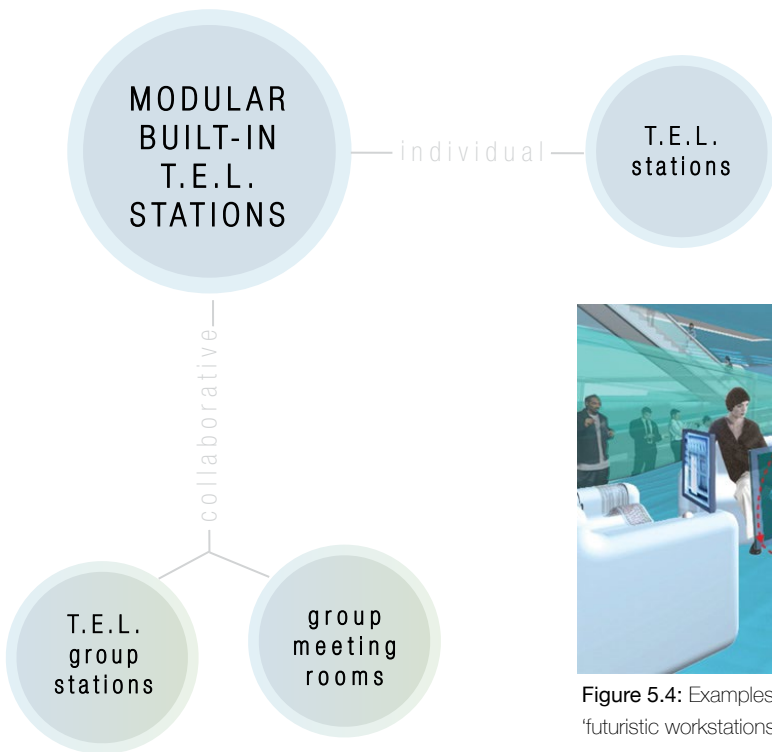


Figure 5.4: Examples of 'futuristic workstations'

5.7.1 MODULAR T.E.L. PODS

Figure 5.4 indicates examples of visionary futuristic 'workstations' in which the boundary between technology and physical ergonomic dimensions is blurred; the technology-enablement is integrated with the physical elements.

It also focusses on accommodating physical human needs that are compromised by the static computer screen sitting position - for example integrating walking and / or running tracks to the station (where a hamster-wheel meets an office desk).

Another focus point is the adjustability of the seating, screen heights, and operability to accommodate different and personalised user-requirements.

Figure 5.5 also shows adjustable group-working stations that are integrated with technology to ease the workflow and promote a communal, social interactive working environment.



Figure 5.5: Adjustable group working stations





Figure 5.6 illustrates newly emerging (currently existing prototypes) technologies that visualises the way forward with regards to the digital display screen and which will have an impact on the spatial requirements.



A.) FLEXIBLE DISPLAY:

Thin and bendable LED screen which allows for a wider (panoramic) view span.



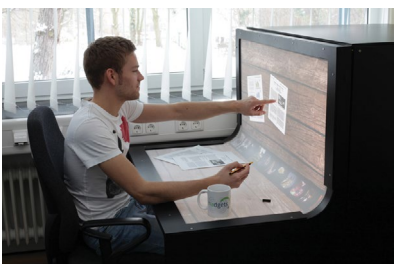
B.) HOLOGRAPHIC PROJECTION:

- Concentrated light projection
- Visible in mid air but display is better when projected in front of a blank backdrop



C.) AUGMENTED REALITY:

- Mixed reality whereby virtual elements are seen through A.R. headset in the context of the real physical surroundings. Depending on the content, a blank backdrop may be necessary



D.) BENDABLE SCREEN-DESK

- Desk and display screen in one whereby physical user-input can happen directly into the screen interface

Figure 5.6: Newly emerging technologies

In light of these examples, the spatial requirement for the T.E.L. pod (whether individual or group configuration) is summed up in the following:

- Connection points to whatever electrical and data services necessary for the specific technology
- Adjustable ergonomic constituents
- In most cases a blank backdrop plane (onto which light projections can be shown, against which augmented projections can be viewed or into which digital display screens (whether bendable or not) can be mounted).

LEARNING COMMONS

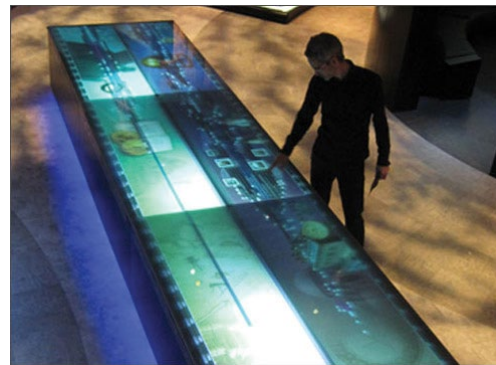
“interactive learning”

interactive [open] T.E.L. commons

5.7.2 LEARNING COMMONS

The term ‘learning commons’ typically refers to ‘learning spaces, similar to libraries and classrooms that share space for information technology, remote or online education, tutoring, collaboration, content creation, meetings and reading or study’ (Educause, 2011). It is frequently noted as a model for the “library of the future” (Attis, 2013).

DIGITAL LEARNING SCREENS:

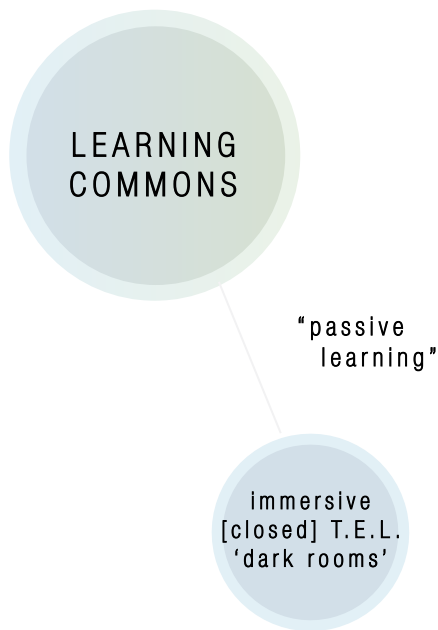


Open-ended spaces where learning material is exhibited and learners can immerse themselves as a collective and ‘experience’ the process together with other people; content can be discussed and analyzed together in an informal manner. In this way learning becomes a social experience when topics are visibly selected and learners are aware of similar interests between themselves and others around them.

INTERACTIVE LEARNING EXHIBITIONS:



The learner becomes engaged with the content when the technology-enabled-learning medium is made interactive and ‘fun’.



IMMERSIVE LEARNING EXHIBITION (DARK) ROOMS:



Separated exhibition rooms in which learning content, informative documentaries and so forth can be exhibited and the learner can immerse himself in these. The learner himself can become a participant in determining what gets displayed by means of accessible 'control stations' (Unlike a museum in which the content displayed is pre-arranged).

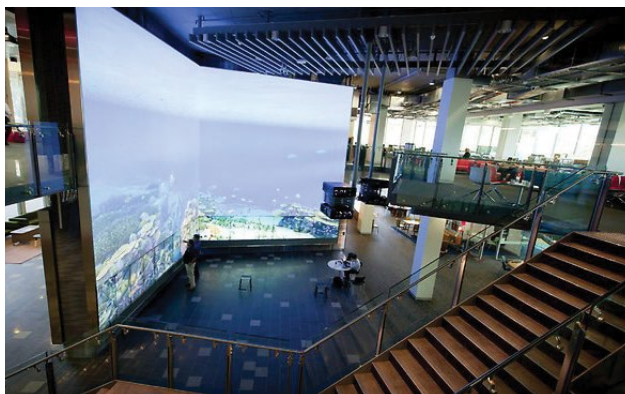


Figure 5.7: Interactive digital screens

Learning screen can double up as a display medium for film screenings



SOCIAL
&
PLAY

T.E.
travelling
and games
arcade



YOUTH IN
FREE TIME

HAVING FUN
WITH FRIENDS IN
GAMES ARCADE



ONLINE
GAMER

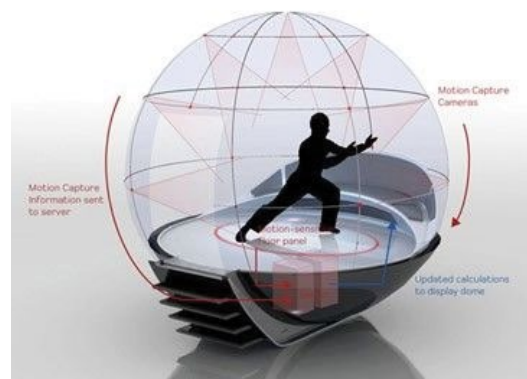


VIRTUAL
TRAVELLER

AROUND THE GLOBE

5.7.3 T.E.L. TRAVELLING AND GAMES ARCADE

The technology-enabled-gaming and -travelling arcade provides recreational activities when learners seek to take a break from their studying. This arcade constitutes various digital as well as virtual and augmented reality gaming activities. It includes both group and individual gaming pods, which are comprised of an omni-directional treadmill (see Figure 5.8) and in some cases a 360 degree projection and motion-tracking dome (see Igloo Vision example in Figure 5.9). Inside these pods the gamer or traveller can virtually experience his surroundings, walk and look around and interact with other characters.



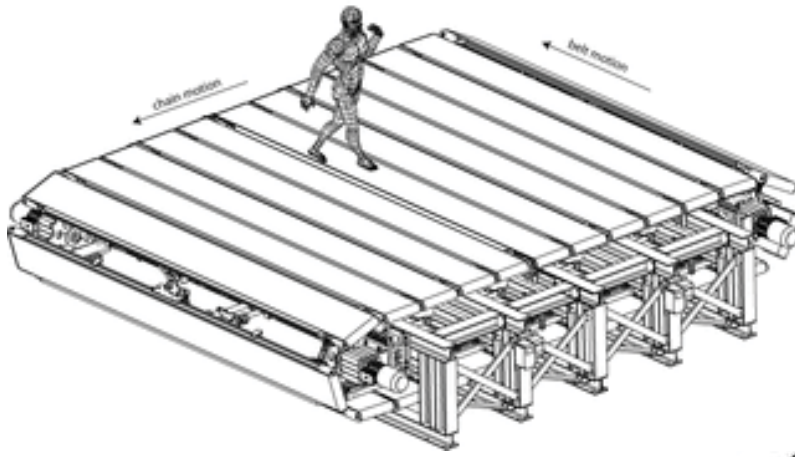


Figure 5.8: Omni-directional treadmill

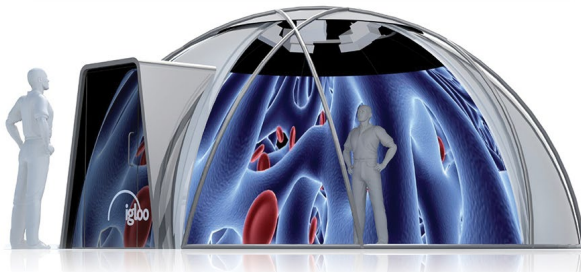
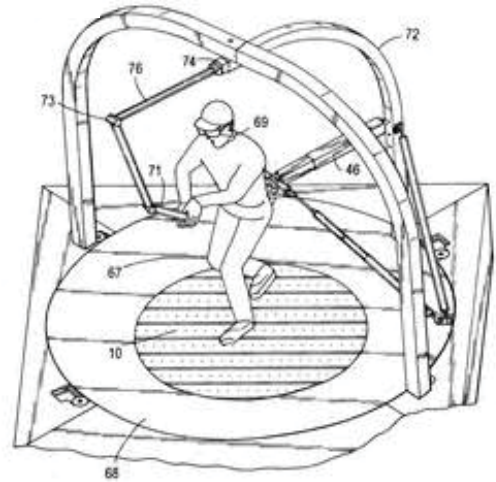
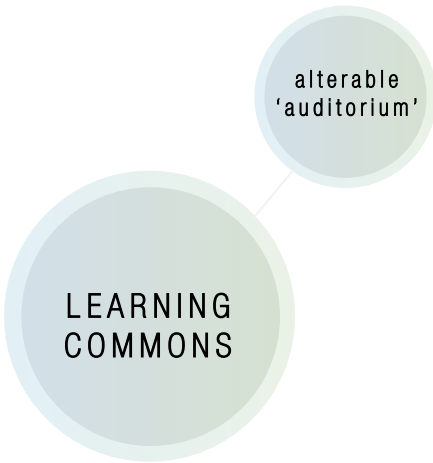


Figure 5.9: 360 degree projection and motion tracking





5.7.4 ALTERABLE 'AUDITORIUM'

In light of the underlying theory of time and change and the alterability of architecture, the conventional *auditorium* typology is viewed rather as a collective assembly of gathered people in a number of situations. These include the accommodation of collective educational functions, such as a public lecture venue, holographic-projected lectures or even educational film-screenings. On the recreational side, the 'gathering space' accommodates events such as film screenings, live or virtually-projected music shows, light-projection concerts etc.

In addition to this the venue can be rented out as a completely open, large volume hall for exhibitions. These different scenarios therefore suggests a modular, dismantable seating arrangement which can be altered and reconfigured for different situations, or completely disassembled. *Theatre on the Fly* (Figure 5.10) is a travelling modular structure with seating levels that can be constructed or dismantled wherever need be.

Figure 5.11 illustrates the holographic projection technology method for virtual characters. With this technology one is able to conduct a lecture or a live interview with a correspondent or advisor on the subject which is on the other side of the planet, but is holographically projected onto the stage. This technology comes in handy when, during the lecture, something arises that is best explained when physically demonstrated in real time by the guest speaker.

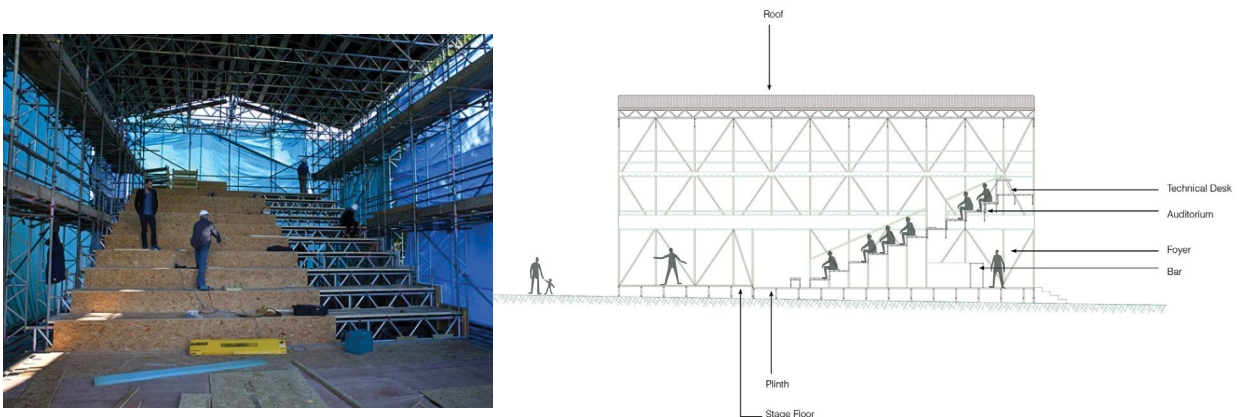


Figure 5.10: Theatre on the Fly

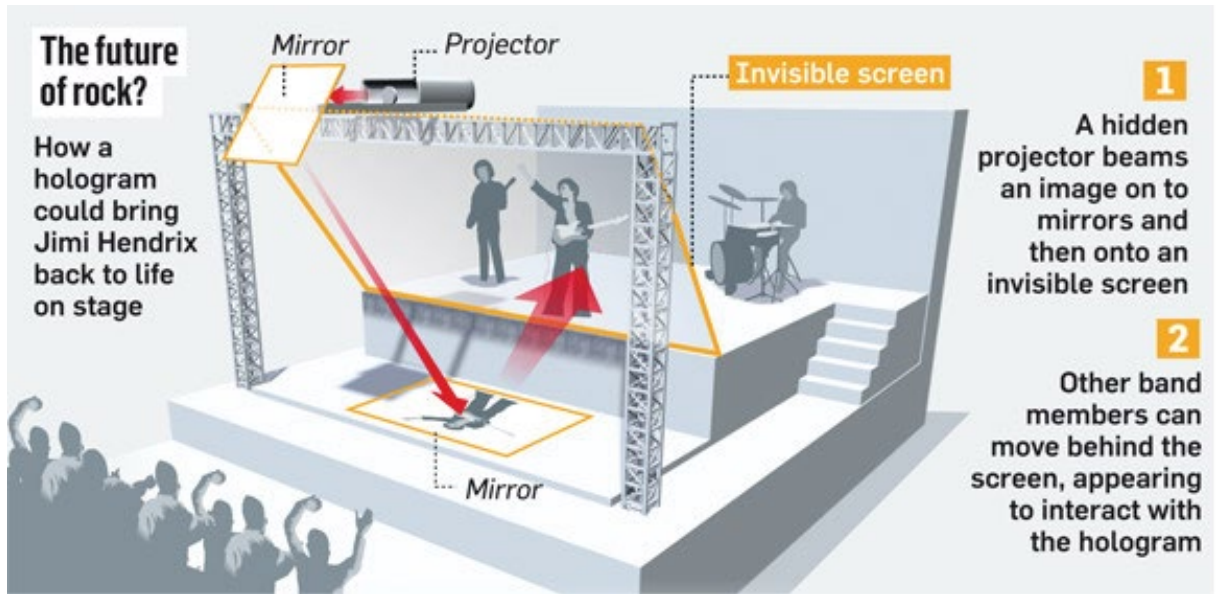
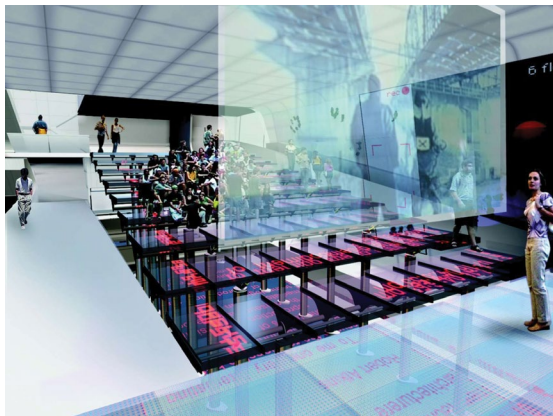


Figure 5.11: Holographic projection for stage backdrop



Figure 5.12: Eyebeam museum proposal by Diller, Scofidio and Renfro



5.8 DEVELOPMENT SCENARIO

As previously mentioned, the GPW block is owned by the Department of Public Works. As illustrated in Figure 5.13 the T.E.L. Centre will be a government-funded and developed project by the DPW in relation with the Department of Education. This will occur as a platform to accommodate existing state-provided educational programmes beyond formal schooling, such as the EPWP (Expanded Public Works Programme) which has a sub-programme of a skills-training and business enterprise development.

The EPWP is sub-divided into four categories namely Infrastructure, Non-state, Environment and Culture and Social. (EPWP, 2013). The skills training and development (Vuk'uphile) (EPWP, 2013) fall largely under the infrastructure division, which constitutes the development of labour intensive projects to provide work for unemployed people. When enrolled in this programme, the worker is provided with the necessary technical training for the specific construction methods that will be used in the respective infrastructure project, (whether they are building roads, houses, landscaping, other infrastructural elements etc.).

In addition to this, the Social subdivision presents the 'Kha Ri Gude (Tshivenda for 'let us learn'), which is a mass literacy campaign specifically aimed at adults who missed out on their schooling (EPWP, 2013).

As explained in sections 5.3 and 5.4, this project proposes an expansion within the EPWP of vocational trades skills- and creative-arts-training conducted with digital e-learning and virtual reality. The training constitutes instructive learning from a virtual tutor and with regards to practical training, the virtual system tracks physical demonstrations by means of motion-tracking gloves and 3D-printed (at the Production House (saw-tooth building)) plastic simulations of the actual operating tools necessary; furthermore the practical light-industrial craft techniques can additionally be exercised at the Production House.

The T.E.L. Centre is, however, not limited to state-driven training programmes; the development scenario envisions the project taking the shape of a private-public-partnership (P.P.P.) service in the way of the government to give (tax -) incentives to private-sector companies to provide skills-training courses and professional discipline-specific learning material for any interested party. This government-provided incentive can also form part of the BBBEE skills-development framework for the private sector to score accreditation points for providing a skills-development training service for the public. The following scenarios illustrate this idea:

- A practising architecture firm puts together a virtual presentation (with the help of the T.E.L. Centre's virtual programmers) that truly portrays what the profession is about to a prospective student; a virtual tour can be 'experienced' from the architect's point of view, by the user to effectively understand the process of creation from briefing point up to completion of the building.

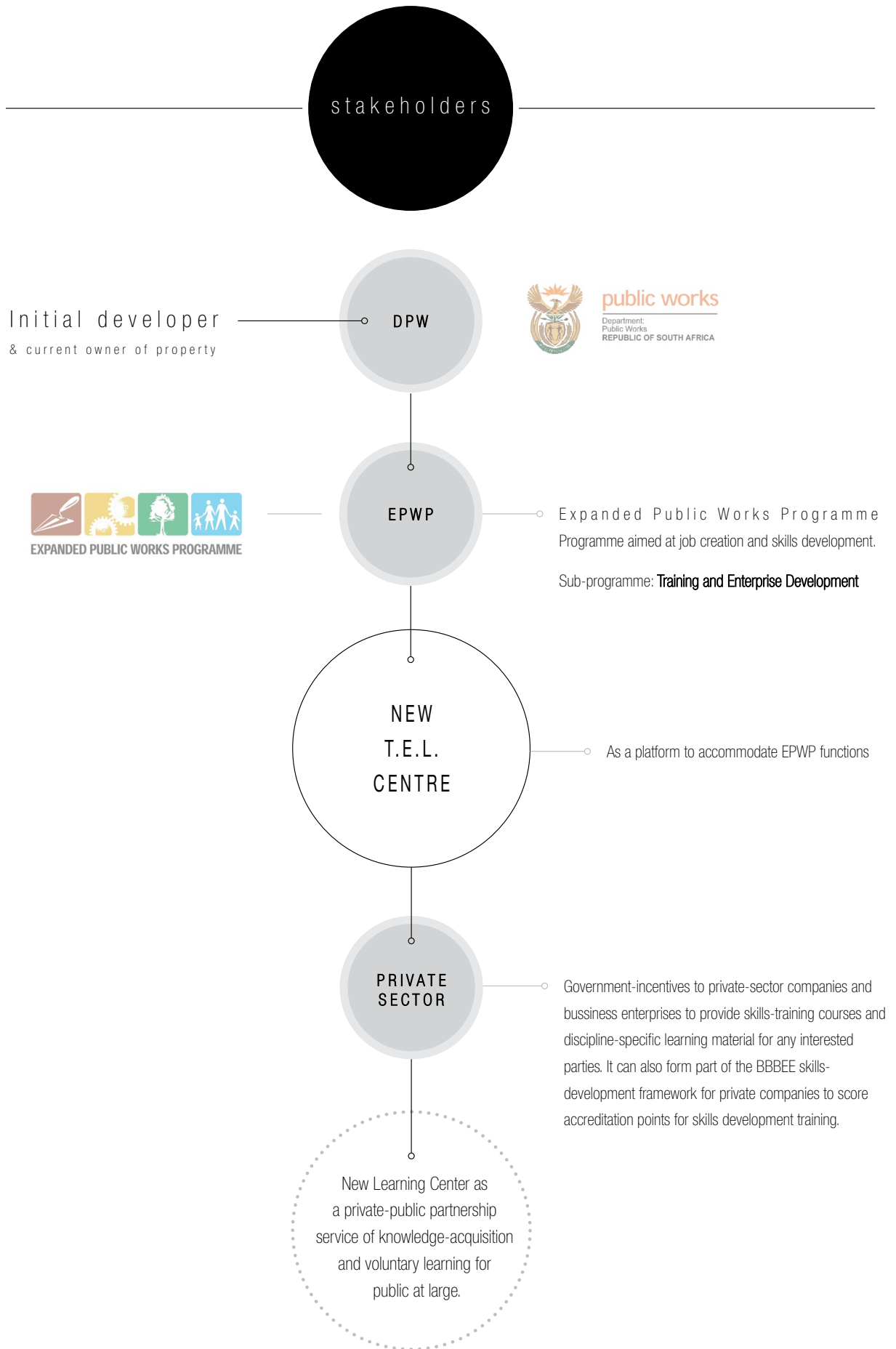


Figure 5.13: Development scenario (Author, 2016)

- A law firm can give a true representation of what the experience of a cross-examination in court is like
- A surgeon can give the learner a true experience of what it feels like with someone's life in their hands; the list can go on.
- Beyond just an introductory virtual tour of the occupation, the professional can effectively provide training courses on their specialised field of study. It can replace the 'book' that many experienced professionals want to write at the end of their careers.

In conclusion, Figure 5.14 sums up the existing and proposed learning programmes hosted by the EPWP and accommodated at the T.E.L. Centre; but the learning centre is, however, also not limited to people who form part of a training programme; it is open to the general public for whoever is in need of a public learning facility. As already mentioned, Figure 5.3 highlights some of the typical users to form part of the clientele.

- Students that are enrolled in an e-learning course can sit and study in the T.E.L. pods
- Students or school children with group projects can use the group T.E.L. pods
- Freelance professionals can use the technology-enabled facility as an office space
- Youths (or anyone else) can use the technology-enabled gaming arcade for recreational purposes
- Any interested party (for example archeology students) can virtually travel the world
- Campus-less students (in light of protests and campus-seizure scenarios) can utilize the T.E.L. pods as well as the 'alterable auditorium'
- This collective gathering space can also be rented out as a conference facility to outside parties for public lectures etc., or for entertainment purposes (- blending education and recreation).

The intention is that the facility will be hosted and managed by the EPWP itself, and that it will function on a membership arrangement - with those who qualify for subsidiary membership grants to be funded by the state.

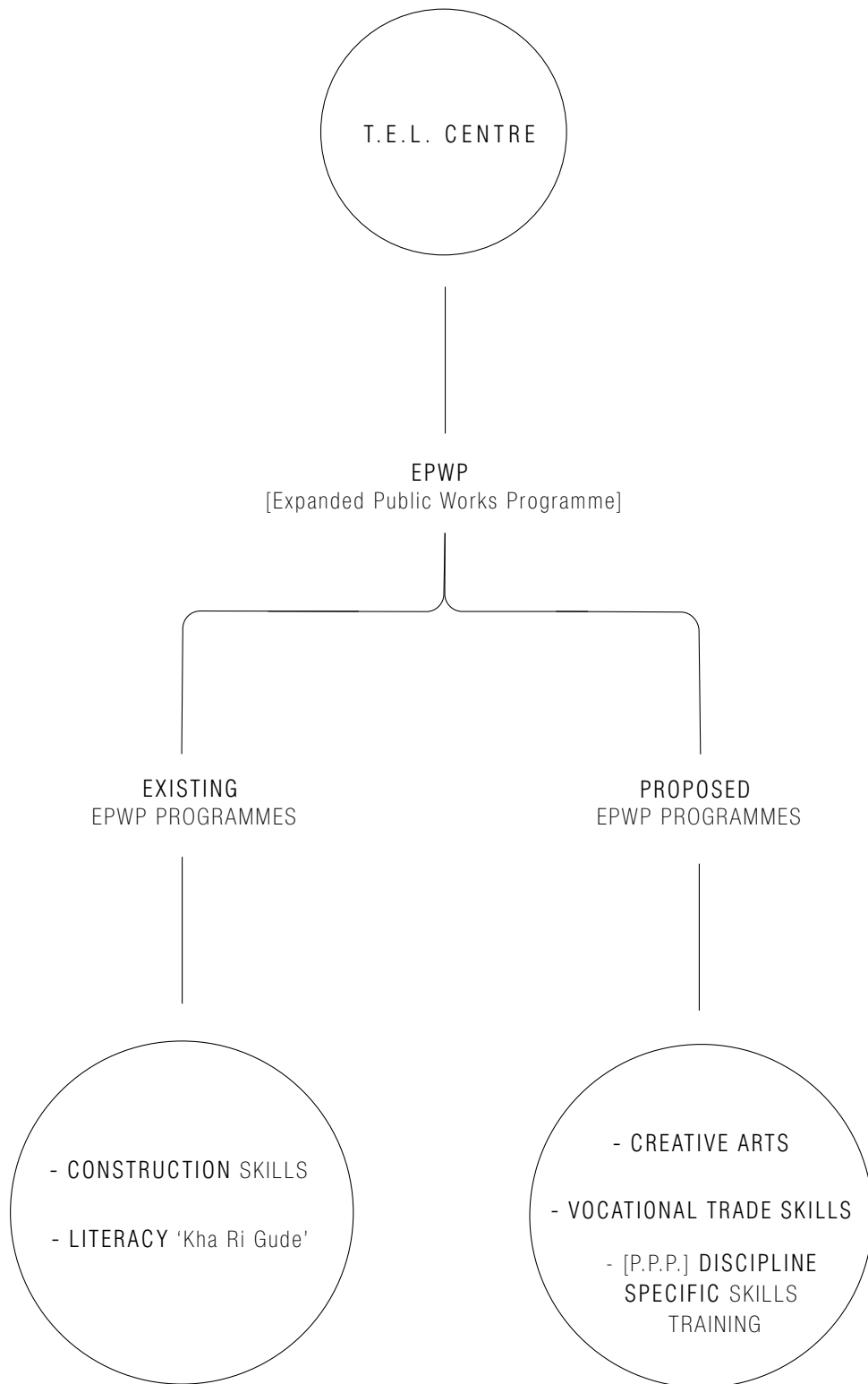


Figure 5.14: Learning programmes in T.E.L Centre

