

Paradigm Shift in the Education System in Kenya: Aligning with the 21st Century Skills and Needs

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Abstract: A good education system empowers people for economic development, promise peace, justice, equal and sustainable future. With this association in mind, the purpose of this study was to find out whether Competency Based Education (CBE) aligns with the 21st Century skills and needs. This study investigated education reforms meant to respond to the social and economic needs of students and society in Kenya. The study critically determined existing link between CBE competencies and 21st Century skills and needs. Data was collected using a questionnaire and analyzed using both descriptive and inferential statistics. Person product moment correlation coefficient was used to establish the correlation between CBE Competencies and 21st Century skills and needs. The study findings indicated that the competencies in CBE are well aligned with the 21st Century skills and needs. From the findings, it was recommended that education stakeholders in Kenya should mobilize and encourage the public to embrace CBE system and provide full support. These study findings should therefore be a reference to inform the Kenyan public to support the new system of education and the new curriculum design for the country to move forward.

Keywords: Education system, Paradigm shift, aligning, 21st Century skills and needs, Kenya

Introduction

The United Nations Sustainable Development Goal 4 (SDG 4) identified education to be at the heart of the 2030 agenda for sustainable development and essential for success of all SDGs (SDGs, 2015). Recognizing the important role of education, the 2030 agenda for sustainable development highlights education as a stand-alone goal (SDG 4). The United Nations while addressing current and future global and national educational challenges emphasize quality education as one that presents enormous benefits. Education has a key role in eradicating poverty; helping people to obtain decent work, raise their incomes and generate productivity gains that fuel economic development. It is therefore, critical to develop education systems that are more resilient and responsive to the global needs.

According to the United Nations, each country has to take account of their education systems, plans and policy agendas Kenya included. Governments have the primary responsibility to deliver on the right to education, and a central role as custodians of efficient, equitable and effective management and financing of public education.

Kenya in her vision 2030 recognizes that in the process of the emergence of the knowledge economy associated with an increase in science-related and technology- related activities (GOK, 2007). Further, the vision emphasized the role of science, technology and innovation (STI) in modern economy, in which new knowledge plays a central role in wealth creation, social welfare and international competitiveness. Technological advances have also reduced the cost of transport, communication, and created new opportunities for business and employment. According to the vision STI has therefore, become central to the new economic sectors that have given momentum to the upward growth of knowledge-based economies as a whole over the past few decades. Education and training of all Kenyans is therefore fundamental to the success of the vision. Through education, citizens are equipped with knowledge and understanding that enables them take informed choices about their lives and those facing Kenya and the world as global citizens.

The 21st Century skills are abilities necessary for one to thrive to success in this digital world where learning never stops. All learners need this skills and knowledge. These skills prepare our children for successful learning in school and also lead them towards excellence in career and future life. The 56th Annual World Economic Forum (WEF) held on 19th to 23rd January 2026 in Davos-Klaster Switzerland meant to address the world's most pressing challenges. WEF identified two main challenges facing Education systems in most countries in the 21st Century as: (a) access and equity, (b) Training and trainers. The forum noted that despite the increase in technology and innovation, there is need for countries to invest in people at scale. This can be achieved by: (i) re-skilling employees, (ii) focusing on Artificial intelligence (AI) and digital skills as accelerators of change, (iii) Launch of learning to earning sandbox: integration of education with paid works hence, aligning universities, employers and governments. The forum acknowledged that AI is delivering real- world results (WEF, 2026).

Literature Review

An in-depth analysis of performance indicators across 91 countries found out stark differences for different skill types not only across income clusters, as defined by World Bank, but also within the same income cluster and within countries. While the differences are most pronounced between developed and developing countries, wide variations were found in performance among high-income countries (UNESCO, 2015). In addition, differences were found within countries in terms of performance on foundational literacy versus high-order competencies and character qualities. The high income Organization of Economic Co-operation Development (OECD) developed countries such as the United States of America (USA) Germany, Japan and the United Kingdom (UK) – tend to perform much better on average across most skills than developing countries in the upper - middle – income group, which includes countries such as Brazil, Malaysia, South Africa and Turkey (UNESCO, 2015). For instance, median performance for upper – middle – income countries literacy test by the Programme for International Students Assessment (PISA) was lower than the high income among the OECD countries.

Virtually, none of the lower - income countries take part in comparable tests, such as Programme for International Students Assessment (PISA). A high-level analysis of regional tests, such as the Southern and Eastern Consortium for Monitoring Education Quality (SACMEQ), does allow a ranking comparison inclusive of some lower – income countries for literacy and numeracy (UNESCO, 2015). The analysis confirms that high – income countries do indeed perform better. However, notable exceptions exist, such as Vietnam, which ranks on par with Germany and ahead of France on literacy, and Tanzania, which ranks ahead of Brazil, Malaysia, Indonesia and South Africa on literacy in the sample.

These exceptions show that income is only one of the factors affecting education outcomes. As such, it is important to holistically evaluate unique country contexts when devising solutions to address skill gaps. Developed countries with large economies such as the USA, UK, China, Germany and Japan made reforms to their Education systems to address the needs of the 21st Century. Similarly, Asian countries revamped their education systems to improve the education outcomes. This has been evident during PISA, a global educational performance ranking of countries which assesses 15years old students in Science, Mathematics and Reading. The Asian Countries like Singapore, South Korea, Vietnam and Malaysia have been performing well.

Competency Based Education

Lately, African countries such as South Africa, Nigeria, Rwanda, Tanzania and Kenya have been changing their systems of education to CBE, though with challenges (Wafula, 2026a). Through education Kenya aspires to provide knowledge, skills, attitudes and competencies required for the 21st Century to steer the country to the economic and social goals. With this in mind Kenya initiated changes in the education system from the previous 8-4-4 to the present CBE in 2017 (KICD, 2017). The 8-4-4 system of education which was more rigid and examination oriented to the CBE which is flexible and competency based.

In 2017 the government of Kenya through the ministry of education launched CBE meant to train holistic learners equipped with 21st Century skills, knowledge and attitudes for the job market (Kubai (2023). The first cohort of CBE learners transitioned to Grade 10 in senior secondary schools in 2026 (Wafula, 2026a). The CBE group of learners will transition to university and other tertiary learning institutions in 2029 (KICD, 2025).

In CBE teachers are facilitators and are supposed to integrate Information Communication and Technology (ICT) across all learning disciplines in the teaching and learning process to ensure learners acquire technological skills that would help them solve problems in the present technological world today (Kubai, 2023). Kenya desires to develop a strong and most diverse human resource pools in the

region (GOK, 2007). Hence, need to re-orient education to focus on the changing economic and technological trends, in line with the national aspirations as expressed in vision 2030.

21st Century skills and needs

There is a compelling educational shift from acquisition of knowledge and skill to development of learner competencies needed in the 21st Century for them to flourish globally in the present job market. The shift can be attributed to the rapid technological revolution and increased globalization hence need for adaptation to the changing world of work (Sangwa, 2025). This informed Kenya's shift to CBE system. Furthermore, the Basic Education Curriculum Framework (BECF) highlighted the following paradigm shift from the former 8-4-4 system of education to the present CBE as follows:

The Paradigm Shift	
From(less)	To (more)
. Content focus	. Focus on Competencies
. Rigid and prescriptive curriculum	. Flexible with opportunities for
With limited flexibility	specialization – pathways
.Focus on summative assessment	. Balance between formative &
& competition (High stakes exams)	summative assessment, and excellence
. Emphasis on schooling	. Emphasis on Education
Teaching	. Learning

Source: CEMASTE (2026). Basic Education Curriculum Framework (BECF)

Stakeholders in the education sector in Kenya have raised questions whether there is a mismatch between education offered and the skills and needs of the 21st Century. The 21st Century skills essential for success as listed by the World Economic Forum (WEF, 2016) are in three categories: learning skills which include critical thinking, creativity, communication and collaboration. In the second category are literacy skills which include information, media and technology literacy skills. The third category includes life skills namely: flexibility, initiative, leadership, productivity and social skills (WEF, 2015). Further, WEF (2016) listed the following drivers of change as being significant to affect the future jobs and employment trend.

Driver of change	Percentage (%)
Changing nature of work, flexible work	44
Mobile internet; cloud technology	34
Processing power, Big Data	26
Middle class in emerging markets	23
New energy supplies and technologies	22
Climatic change, natural resources	23
Geopolitical volatility	21
Consumer ethics, privacy issues	16

Internet of Things	16
Longevity, ageing societies	14
Young demographics in emerging markets	13
Sharing economy, crowd sourcing	12
Women's economic power, aspirations	12
Robotics, autonomous transport	9
Rapid Urbanization	8
Advance manufacturing 3D printing	6
Artificial intelligence	7
Advanced materials, biotechnology	6

Source: World Economic Forum: Future of jobs (2016)

Together, technological, socio-economic, geopolitical and demographic developments and the interactions between them will generate new categories of jobs and occupations while partially or wholly displacing others. They will change the skills sets required in both old and new occupations in most industries and transform how and where people work, leading to new management and regulatory challenges.

Further, WEF (2016) estimated that 65% of children entering primary school today will ultimately end up working in completely new job types that don't yet exist. In such a rapidly evolving employment landscape, the ability to anticipate and prepare for future skills requirements, job content and the aggregate effort on employment is increasingly critical for businesses, governments and individuals in order to fully seize the opportunities presented by these trends and to mitigate undesirable outcomes.

Conceptual Framework

This study was guided by a schematic model. In this model Independent Variables (IVs) are placed on the left and Dependent Variables (DVs) on the right separated by the intervening variables in the middle. The conceptual framework showing relationship between CBE and 21st Century skills is diagrammatically in Figure 1.

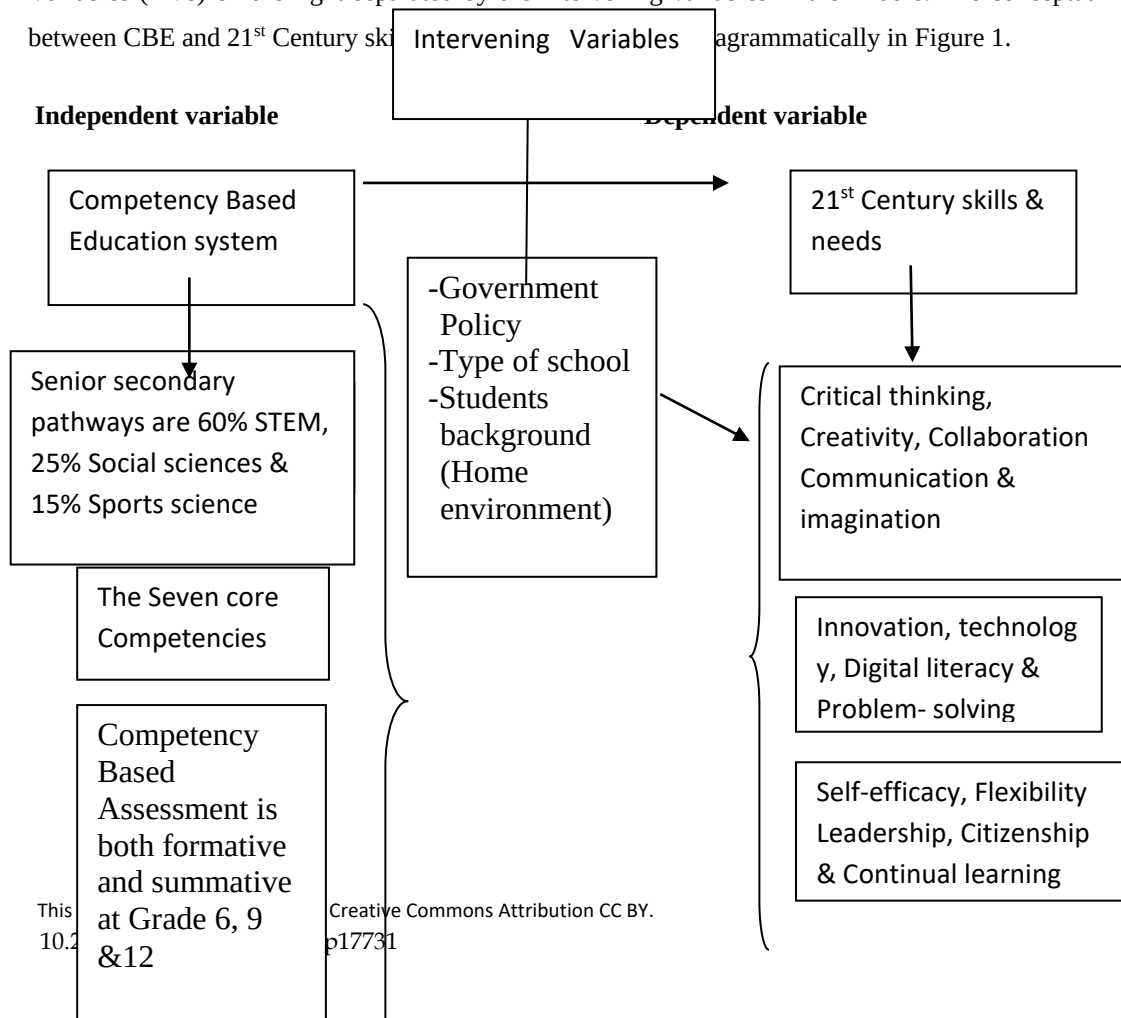


Fig1. Source: Researcher (2026).

Figure 1, illustrates that 21st Century skills and needs acquired by learners are influence by the system of education in this case CBE. The first category of 21st Century skills are learning skills: critical thinking, creativity and imagination, communication and collaboration. The second category has literacy skills which include information, media, technology literacy skills and problem-solving. The third category has life skills which include self-efficacy, flexibility, leadership, productivity continual and social skills (WEF, 2016). According to Muchira et al (2023), evidence from the USA and South Korea indicated that the implementation of CBC resulted in improved problem-solving, lifelong learning skills, self-efficacy, and autonomy in learners.

Objectives of the study

1. To identify the competencies in CBE education system in Kenya.
2. To investigate the 21st Century skills and needs.
3. To determine the alignment of CBE competencies to the 21st Century skills and needs.

Methodology

The study adopted a descriptive survey research design. Bungoma County was purposefully sampled to represent the 47 counties in Kenya. By using stratified sampling technique, two secondary schools from each of the 12 sub-counties within the County were purposively selected, making a total of 24 public senior schools. These schools included two C1, four C2, eight C3 and ten C4 schools.

The target population was 5523 senior school teachers handling Grade 10 learners. A sample size of 357(192 male and 165 female) was selected using simple random sampling technique in line with recommended percentages by Mugenda and Mugenda(2003) and Mitchell and Jolley (2007). The respondents comprised 16 Principals, 22 Deputy Principals and 319 teachers selected from 22 public senior schools using stratified simple random sampling techniques. Questionnaires and document analysis were used to collect data.

A structured questionnaire consisting of both closed-ended and open-ended questions was administered to teachers to collect data about Competency Based Education and 21st Century skills and needs. But before administering the questionnaires, reliability and validity of the tools was established through piloting, triangulation and consulting with the experts in educational research. The questionnaire was piloted in two schools outside the sampling frame and a reliability coefficient was found to be 0.84, making it suitable for data collection.

The quantitative data collected from the closed-ended questionnaires was entered into the computer and using the SPSS computer software data was analyzed. The data was analyzed using descriptive statistics and findings presented in the form of frequency tables and percentages. While for the qualitative data from the open-ended questionnaires was generated into themes and categories using codes then interpretations made.

Findings and Discussion

The first objective in this study was to identify competencies in CBE system in Kenya. To achieve this objective, responses were obtained from a series of seven statements depicting various CBE competencies. Respondents were measured on a five-point Likert scale ranging from 1 = Strongly Agree (SA) to 5 = Strongly Disagree (SD). The categories were collapsed into agree and disagree. Statements depicting various competencies in senior schools in Kenya are shown in Table 1.

Table1. CBE competencies in Kenya

Statement	SA	A	U	D	SD
1.CBE inculcate critical thinking & problem solving	212	49	1	19	76
2. CBE inculcate creativity & imagination	223	71	5	25	33
3. CBE inculcate communication & collaboration	196	63	3	41	54
4. CBE inculcate digital literacy	188	86	8	40	35
5. CBE inculcate self- efficacy	209	64	9	35	40
6. CBE inculcate citizenship	201	83	1	31	41
7. CBE inculcate learning to learn	158	94	6	32	67
Total	1387	510	33	223	346
Percentage (%)	55.5	20.4	1.3	8.9	13.8
Agreeing / Disagreeing (%)	75.9		22.7		

As indicated in Table 1, a higher percentage (75.9%) of the respondents confirmed that CBE inculcate in learners the listed competencies. Only (22.7%) of the respondents were of the contrary opinion.

The second objective was to investigate the 21st Century skills and needs. To achieve this objective, respondents were asked to respond to a set of twelve statements depicting 21st Century skills and needs. The responses were measured on a five-point Likert scale ranging from 1= Strongly Agree to 5= Strongly Disagree (SD). The categories were collapsed into agree and disagree as shown in Table 2.

Table 2. 21st Century skills and needs

Statements	SA	A	U	D	SD
1. Critical thinking is a 21 st century need	200	48	0	48	61
2. Education should help solve-Problem in life	218	51	0	45	46
3. Creativity and imagination are 21 st century skills	193	53	3	49	59

4. Communication & collaboration are 21 st century skill	207	74	1	18	58
5. We need digital literacy to survive today	258	36	0	43	20
6. Employers choose people with self-efficacy	198	78	4	21	56
7. CBE promote continual learning	129	94	12	65	69
8. CBE fosters leadership & initiative skills in learners	186	57	9	52	53
9. CBE promote innovation & effective use of technology	193	68	2	35	59
10. CBE promote unity and teamwork	134	99	0	36	88
11. CBE inculcate national and global citizenship	196	59	2	21	81
12. Flexibility & productivity are 21 st century skills	151	89	7	47	63
Total	2263	806	40	480	713
Percentages (%)	52.8	18.8	0.93	11.2	16.6
Agreeing / Disagreeing (%)	71.6		27.8		

A majority of the respondents (71.6%) as shown in Table 2, agreed with the statements that we need the listed skills to survive in the 21st Century. A minority (27.8%) on the contrary did not agree with the listed skills and needs of the 21st Century.

The third objective in this study was to determine the alignment of CBE competencies with the 21st Century skills and needs. To achieve this objective, respondents were asked to respond to a set of eight statements. The responses were measured on a five-point Likert scale ranging from 1= Strongly Agree (SA) to 5= Strongly Disagree (SD). The categories were collapsed into agree and disagree as shown in Table 3.

Table 3. Alignment of CBE with 21st Century skills and needs

Statement	SA	A	U	D	SD
1. Critical thinking align with 21 st Century skill & need	184	76	1	44	52
2. Problem-solving align with 21 st Century skill & need	223	31	0	23	80
3. Communication/collaboration align with 21 st century need	113	69	9	79	87
4. Digital literacy/ innovation align with 21 st century needs	156	92	0	41	68
5. Self-efficacy/ leadership align with 21 st century needs	191	58	2	58	48
6. National/ global citizenship with 21 st century skill & needs	166	95	0	29	64
7. Learning to learn align with 21 st century skills & needs	172	68	7	54	56
8. Flexibility & productivity align with 21 st needs	198	46	3	61	49

Total	1403	535	22	389	504
Percentages (%)	49.1	18.7	0.7	13.6	17.6
Agreeing /Disagreeing (%)	67.8			31.2	

A larger proportion (67.8%) of the respondents agreed with statements, a confirmation that CBE is well aligned with the 21st Century skills and needs. A minority (31.2%) were of the contrary opinion as shown in Table 3.

In orders to establish relationship between CBE competencies and 21st Century skills and needs; Person product moment correlation coefficient test was done. Results are presented in Table 4.

Table 4. Person correlation coefficient between CBE competencies and 21st Century skills and needs

	<u>CBE competencies</u>	<u>21st Century skills & needs</u>
CBE competencies	—	.03
21 st Century skills & needs	.04	—

Significant at $p < .05$

Results presented in Table 4 show that there was a significant and positive correlation between CBE and 21st Century skills and needs. Pearson correlation tests revealed significant relationship between CBE ($P = .04$) and ($P = .03$) respectively. Hence alignment with 21st Century needs.

Discussion

The first objective in this study was to identify the competencies in CBE education system in Kenya. The results in Table 1, confirmed that the seven competencies in CBE education in Kenya entails 75.9% critical thinking , problem solving, creativity and imagination, communication and collaboration, digital literacy, self-efficacy, citizenship and learning to learn. This finding is in agreement with Ober et al., (2025), Sangwa (2025) and Mboneza (2021). For example, Ober et al., (2025) observed that essential competencies such as collaboration and critical thinking are integral to long-term success.

Similarly, Mboneza (2021) identified four categories of CBE competencies as (a) Core subjects: 3Rs; Reading, wRiting and aRithmetics, (b) information, media, and technology skills, (c) learning and innovation skills commonly called ‘4Cs’: critical thinking and problem solving, communication and collaboration, creativity and, (d) life and career skills; learning, adapt to change/flexibility and lead others. Moreover, Sangwa (2025) revealed that across Africa, South east Asia, and Latin America, CBE diffusion is propelled by soft-governance mechanisms including benchmarking, policy borrowing, technical assistance, and donor-aligned reform, producing convergent curricular and outcome based assessment. Based on the previous studies discussed, the present study agreed with previous studies that, CBE competencies convergence is worldwide therefore Kenya is not an exceptional.

The second objective was to investigate the 21st Century skills and needs. Results indicated that a majority, 71.6 % of the respondents agreed with the listed skills and needs for the 21st Century. A minority, 27.8 % were of the contrary opinion. This study finding converges with previous studies like Ajuoga and Ongunya (2023); Aretichalkiadaki (2018) and the World Economic Forum (WEF) report (2016), the trio highlighted future skills needed for the job market. Ajuoga and ongunya (2023) noted that the 21st Century skills are abilities and attributes that can be learned to enhance ways of thinking, learning, working and living in the world. The skills include: creativity and innovation; critical thinking; problem solving; decision making, learning to learn, communication, collaboration (teamwork) information literacy, ICT literacy, citizenship both local and global, life and career skills, personal and social responsibility. In addition, the study further observed that in CBE competencies like effective communication, critical thinking and life-long learning are critical to unlocking the limited abilities of labor in the 21st Century.

The WEF (2016) listed core work-related skills in three categories namely: (a) abilities: cognitive and physical abilities; (b) basic skills: content and processing abilities; (c) cross-functional skills: social, technical, system, complex problem- solving and resource management skills. Therefore this study revealed that most of the skills needed for one to thrive in the 21st Century are incorporated in CBE system.

The third objective in this study was to determine the alignment of CBE competencies with 21st Century skills and needs. The study finding, indicated that a majority 67.8 % of the respondents agreed that CBE competencies are aligned to the 21st Century skills and needs. A minority 31.2 % were of the contrary opinion. This study finding is in agreement with the WEF (2016) report, the future of jobs: Employment, skills and workforce; Strategy for the Fourth industrial Revolution. WEF recommended that firms can no longer be passive consumers of ready-made human capital. They require a new mindset to meet their talent needs and to optimize social outcomes. The forum stated four immediate actions as: (a) reinventing the human resource function, (b) making use of data analytics, (c) leveraging flexible working arrangements and online talent platforms, (d) talent diversity. In addition, the WEF suggested the following long term actions as: (a) rethinking education system by incentivizing lifelong learning and, (b) businesses should work closely with governments, education providers to imagine what a true 21st Century curriculum. Hence cross – industry and public-private collaboration on talent rather than competition.

In the same light, Aswitha (2025) noted that the world is competitive and many companies are looking for candidates who are well skilled rather than academic qualification. Hence, need for change from academic qualification to skill based learning. Sangwa (2025) emphasized global convergence toward Competency-Based Education for the knowledge economy stating that CBE prepares “future-ready” workforce.

Conclusions and Recommendations

This study investigated the alignment of CBE education system with 21st Century skills and needs in Kenya. It was concluded that CBE education system has seven core competencies. The study found out that there are also twelve major 21st Century skills and needs. The correlation coefficient test confirmed a significant relationship between CBE core competencies and 21st Century skills and needs, hence, well alignment. Furthermore, the world is competitive and many employers focus is rapidly shifting from academic qualification to high-demand skills and technical expertise. These will soon result to “skill-first” or “learn to earn” hiring trend. Therefore, the designers of the education system should also shift focus from rote learning to providing 21st Century skills and needs necessary for economic growth.

This study strongly recommends CBE system as the only way to reduce unemployment in the country. These findings should therefore be a reference to inform stakeholders and Kenyan public to support CBE system of education and the new curriculum design for the country to move forward.

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