The Role of ICT Integration in the Teaching and Learning of Clothing and Textiles in Junior Schools in Elgeyo Marakwet County, Kenya

Kemboi Jerotich Sharon[1], Dr. Robert Aming'a[2], Dr. Catherine Sempele[3]

[1] Department of Centre for Teacher Education, University of Eldoret, Kenya

[2] Department of Applied Sciences Education Department, University of Eldoret, Kenya

[3]Department of Hotel and Hospitality Management Department, University of Eldoret, Kenya

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ABSTRACT

Competency-Based Education (CBE) in Kenya requires learner-centred teaching, yet Clothing and Textiles instruction in many junior schools remains largely theoretical, with little use of digital tools. This study examined the role of Information and Communication Technology (ICT) integration in the teaching and learning of Clothing and Textiles in public junior schools in Elgeyo Marakwet County, Kenya. A descriptive survey design was adopted. From a target population of 198 public junior schools, a sample of 873 respondents was drawn, comprising 198 Heads of Institutions (census), 281 Clothing and Textiles teachers (purposive sampling) and 394 Grade 7 and 8 learners (simple random sampling). Data were collected using five-point Likert-scale questionnaires, interview schedules and a lesson observation checklist. Quantitative data were analysed using frequencies, percentages and means in SPSS version 30, while interview data were analysed thematically. Response rates were high: 95.96% for Heads of Institutions, 100% for teachers and 98.22% for learners. Findings showed that ICT integration was minimal. Teachers reported infrequent use of ICT tools during lessons (Mean = 2.24), and ICT tools were observed in use in only 22 of the 190 schools visited (11.6%). Learners and teachers agreed that ICT makes lessons more interesting (Mean = 3.07 and 3.04 respectively), but both groups rated its contribution to understanding, creativity, problem-solving and practical skills weakly (means of 2.40 to 2.83). Heads of Institutions attributed the limited use to inadequate digital devices, unreliable electricity and internet connectivity, and limited teacher training in digital pedagogy. The study concludes that ICT is a recognised but largely unrealised instructional opportunity, with barriers that are infrastructural and technical rather than attitudinal. It recommends investment in ICT infrastructure, teacher capacity building in digital pedagogy, and blending ICT with practical and demonstration methods.

Keywords: ICT integration; Clothing and Textiles; Junior schools; Competency-Based Education; Elgeyo Marakwet County

INTRODUCTION

Effective teaching and learning of textiles in junior schools (JS) largely depend on the role played by appropriate instructional method such as integration of Information and Communication Technology (ICT). According to the competency-based education (CBE) system, learning should be learner-centred, more so in learning areas such as Textile, which involve a lot of practical activities.

East Africa exhibits significant gaps in instructional delivery. In Tanzania, Ndume et al. (2021) report limited ICT integration in secondary schools, citing insufficient ICT infrastructure and limited teacher ICT knowledge and skills. Kenyan studies point to comparable challenges, with Murithi and Yoo (2021) finding that teachers perceived ICT facilities in schools as inadequate. Insufficient teacher training worsens these gaps (Gesare et al.,

2023; Shikomera, 2024). These regional patterns mirror challenges within Kenya's Clothing and Textiles instruction.

Ideally, under Kenya's CBE, Textile lessons are expected to be learner-centred, with frequent integration of ICT to enhance understanding, creativity, and the acquisition of life skills. When these methods are effectively implemented, learners are expected to demonstrate high levels of engagement, improved skill mastery, and better learning outcomes in Textile.

Under the 8-4-4 system, instruction in Clothing and Textiles was largely theoretical, with minimal emphasis on hands-on activities and demonstrations, thereby limiting learners' acquisition of practical skills essential for real-life application. The Competency-Based Education (CBE) system was introduced in Kenya to change this, emphasising learner-centred approaches, practical skill acquisition and competency development.

However, the current situation in Elgeyo Marakwet County suggests that the teaching of Clothing and Textiles in many junior schools has not fully made this shift. According to past research, including Abedi (2024), lessons remain largely theoretical, with minimal integration of ICT. Lecture-based methods therefore continue to dominate, and this persistence of teacher-centred instruction contradicts the core objectives of CBE, which advocate for active learner engagement, creativity and skill mastery. Consequently, learners may not fully develop the intended competencies in Clothing and Textiles, potentially undermining the effectiveness of the curriculum reform. It is therefore necessary to determine the role of ICT in the teaching and learning of Clothing and Textiles in junior schools in Elgeyo Marakwet County, with a view to identifying gaps and informing strategies that can enhance the alignment of classroom practices with the goals of the CBE system.

METHODOLOGY

This study adopted a descriptive survey research design (Creswell & Creswell, 2023) and was conducted in public junior schools in Elgeyo Marakwet County, Kenya, a predominantly rural county of about 454,480 people (Kenya National Bureau of Statistics, 2019). The county was purposively selected because teachers there continue to rely on lecture-based methods despite the shift to the Competency-Based Education (CBE), and because little research has focused on Clothing and Textiles instruction in its junior schools. The target population comprised 198 public junior schools, with 198 Heads of Institutions (HOIs), 947 teachers and 26,151 Grade 7 and 8 learners. Using Yamane's (1967) formula at a 0.05 level of significance, a sample of 873 respondents was determined, comprising 198 HOIs, 281 teachers and 394 learners. HOIs were sampled through census, teachers of Clothing and Textiles through purposive sampling, and learners through simple random sampling. Data were collected using five-point Likert-scale questionnaires for teachers and learners, interview schedules for HOIs, and an observation checklist for Clothing and Textiles lessons. The instruments were piloted in a randomly selected junior school in Uasin Gishu County, using 10% of the sample size (Thabane et al., 2020). Content validity was established through review by supervisors from the University of Eldoret (Amadi, 2023), while Cronbach's alpha coefficients of 0.73 to 0.81, all above the 0.70 threshold, confirmed reliability (Ahmed & Ishtiaq, 2021; Kothari, 2014). After obtaining an introduction letter from the University of Eldoret, a research permit from the National Commission for Science, Technology and Innovation (NACOSTI), and authorization from the Elgeyo Marakwet County Director of Education and the County Commissioner, the researcher administered the questionnaires and conducted interviews with the HOIs. Data were cleaned, coded and analysed using SPSS version 30; quantitative data were analysed using means, frequencies and percentages, while qualitative data were analysed thematically and presented in narrative form, with findings displayed in tables, charts and figures.

Ethical Considerations

Participants were informed of the study's purpose and procedures and signed consent forms, and participation was voluntary and free of coercion. Respondents were assured that their information would remain confidential and be used for academic purposes only, and no names or identification were required on the questionnaires.

RESULTS AND DISCUSSIONS

Response Rate

Findings indicate that 190 (95.96%) out of 198 targeted Heads of Institutions participated in the interviews, while 281 (100%) targeted teachers completed and returned their questionnaires. Additionally, 387 (98.22%) out of 394 targeted Grade 7 and 8 learners responded to the questionnaires administered to them. Table 1 presents response rate findings.

Table 1 Response Rate

Category	Targeted Respondents	Actual Respondents	Data Collection Tools	Response Rate (%)
Heads of Institutions	198	190	Interview	95.96%
Teachers	281	281	Questionnaire	100%
Grade 7 and 8 Learners	394	387	Questionnaire	98.22%

Table 1 shows the response rate results. Findings indicate that 190 (95.96%) out of 198 targeted Heads of Institutions participated in the interviews, while 281 (100%) targeted teachers completed and returned their questionnaires. Additionally, 387 (98.22%) out of 394 targeted Grade 7 and 8 learners responded to the questionnaires administered to them. According to Sataloff and Vontela (2021), a response rate of 70% and above is adequate for analysis and reporting. Therefore, the response rates achieved across all three categories of respondents were more than adequate, implying that the data collected is sufficiently representative to support valid analysis, interpretation and generalisation of the study findings. The consistently high response rate, particularly the 100% return rate among teachers, also suggests strong cooperation from respondents and minimal non-response bias, which strengthens the reliability and credibility of the findings.

ICT Integration in Teaching and Learning of Clothing and Textiles

This section presents findings on the role of ICT integration in the teaching and learning of Clothing and Textiles. It draws on learners' and teachers' questionnaire responses, alongside interview and observation data, to establish how frequently ICT tools are used and their perceived influence on learner engagement.

Learners Responses on ICT Integration in Teaching and Learning of Clothing and Textiles

Table 2 Learners Responses on ICT Integration

Statement	Descriptive	SD	D	N	A	SA	Mean
The use of ICT tools helps me understand Clothing and Textiles concepts better.	Frequency Percentages	75 19.38	115 29.72	35 9.04	125 32.30	37 9.56	2.83
ICT integration makes Clothing and Textiles lessons more interesting and engaging.	Frequency Percentages	55 14.21	105 27.13	35 9.04	140 36.18	52 13.44	3.07
My teacher effectively uses ICT resources such as videos and digital content in class.	Frequency Percentages	90 23.26	120 31.01	35 9.04	105 27.13	37 9.56	2.69
ICT integration improves my creativity and problem-solving skills in Clothing and Textiles.	Frequency Percentages	75 19.38	115 29.72	35 9.04	125 32.30	37 9.56	2.83
ICT has improved my practical skills in Clothing and Textiles.	Frequency Percentages	85 21.96	120 31.01	35 9.04	115 29.72	32 8.27	2.71

Table 2 show the findings on learners' responses on ICT integration. The findings show that ICT integration making lessons more interesting and engaging recorded the most favourable rating (49.62% Agree and Strongly Agree combined; Mean = 3.07), while the item on ICT tools helping learners understand Clothing and Textiles concepts better recorded more disagreement (49.10% Strongly Disagree and Disagree combined; Mean = 2.83).

This suggests that although learners find ICT-based lessons more enjoyable, they are less convinced that it deepens their understanding of Clothing and Textiles concepts.

Similarly, learners rated ICT's contribution to their creativity and problem-solving skills low (49.10% Strongly Disagree and Disagree combined; Mean = 2.83), as well as its improvement of their practical skills (52.97% Strongly Disagree and Disagree combined; Mean = 2.71), while the item on whether teachers effectively use ICT resources such as videos and digital content in class recorded the lowest rating (54.27% Strongly Disagree and Disagree combined; Mean = 2.69). This implies that ICT's contribution to learners' higher-order and practical skills remains limited, which may be related to the limited implementation of ICT in classroom instruction. Taken together with the interest and engagement finding above, these results indicate that the strongest perceived contribution of ICT is to learner interest and engagement, while its perceived contribution to understanding, creativity, problem-solving and practical skills is comparatively weaker.

Teachers Responses on ICT Integration in Teaching and Learning of Clothing and Textiles

Table 3 Teachers Responses on ICT Integration

Statements	Descriptive	SD	D	N	A	SA	Mean
ICT tools such as videos, projectors, computers, or mobile devices are used during Clothing and Textiles lessons.	Frequency Percentages	85 30.25	110 39.15	30 10.68	45 16.01	11 3.91	2.24
ICT integration enhances learners' understanding of practical Clothing and Textiles concepts.	Frequency Percentages	70 24.91	105 37.37	30 10.68	60 21.35	16 5.69	2.46
ICT integration improves learners' creativity and problem-solving skills in Clothing and Textiles.	Frequency Percentages	75 26.69	105 37.37	30 10.68	55 19.57	16 5.69	2.40
ICT integration makes Clothing and Textiles lessons more interesting.	Frequency Percentages	40 14.23	75 26.69	30 10.68	105 37.37	31 11.03	3.04

Table 3 presents findings on teachers' responses on ICT integration. The findings reveal that the majority of teachers disagreed that ICT tools such as videos, projectors, computers, or mobile devices are used during Clothing and Textiles lessons (69.40% Strongly Disagree and Disagree combined; Mean = 2.24). This implies that ICT resources are rarely put to actual use during lesson delivery. Similarly, teachers disagreed that ICT integration enhances learners' understanding of practical concepts (62.28% Strongly Disagree and Disagree combined; Mean = 2.46) and that it improves learners' creativity and problem-solving skills (64.06% Strongly Disagree and Disagree combined; Mean = 2.40). This suggests that teachers themselves doubt ICT's contribution to learners' conceptual and higher-order skills, a view consistent with learners' own perceptions.

However, the largest proportion of teachers agreed that ICT integration makes Clothing and Textiles lessons more interesting (48.40% Agree and Strongly Agree combined; Mean = 3.04), mirroring the pattern observed among learners. This suggests that teachers and learners alike recognise the motivational value of ICT even where its instructional implementation remains weak. The study therefore establishes limited implementation of ICT and a weak perceived contribution to understanding and higher-order skills, alongside a recognised motivational value; on this basis, investment in ICT infrastructure and teacher capacity building is recommended as a means of addressing this gap, rather than assumed to guarantee improved learning outcomes.

Overall, learners and teachers converge on identifying ICT integration's contribution to lesson interest as its strongest perceived benefit, recording their most favourable ratings on this item (learners: Mean = 3.07; teachers: Mean = 3.04). Beyond this point of convergence, however, the two groups diverge in the magnitude of their assessments of ICT's other contributions. Teachers rated ICT's contribution to learners' understanding of practical concepts (Mean = 2.46) and to their creativity and problem-solving skills (Mean = 2.40) considerably lower than learners rated the same constructs (Mean = 2.83 for both), suggesting that teachers are more sceptical

than learners about ICT's instructional value beyond motivation. The two groups also diverge on actual classroom implementation, with learners least convinced that their teacher effectively uses ICT resources such as videos and digital content in class (Mean = 2.69), while teachers themselves reported an even lower frequency of ICT tool use during their own lessons (Mean = 2.24). This suggests that although the motivational potential of ICT is recognised across both groups, teachers regard its limited practical implementation, and their own instructional practice, more critically than learners perceive it to be; this points to ICT infrastructure and teacher capacity building as areas warranting investment.

Interviews with Heads of Institutions revealed that ICT integration in Clothing and Textiles remains minimal. Most Heads of Institutions attributed this to inadequate digital devices, unreliable electricity and internet connectivity, and limited teacher training in digital pedagogy, though most HOIs also acknowledged that on the rare occasions ICT tools are used, learners' interest and engagement noticeably improve. One HOI responded that;

“We have very few working computers and no reliable internet, so ICT use in Clothing and Textiles is minimal.” (HOI 92, personal communication, 2026)

Classroom observations confirm the same pattern: ICT tools were observed in use during lessons in only 22 of the 190 schools visited (11.6%), and ICT resources were integrated into the teaching of Clothing and Textiles concepts in a mere 18 schools (9.5%). Where ICT tools were present, learners were noticeably more engaged, with heightened interest observed in 19 of the 22 schools that used ICT (86.4%). Because this pattern is drawn from the small subset of schools where ICT was actually implemented, it indicates that engagement was high in most of the schools where ICT was used, rather than showing that ICT integration generally increased engagement across the full 190-school study population; this is nonetheless consistent with the questionnaire finding that learners view ICT positively.

Field notes also recorded an impression, rather than a systematically checklist-measured finding, that most schools without ICT tools relied entirely on chalkboard illustration; while not itself a checklist item, this impression is broadly consistent with the infrastructural gap identified through the questionnaire and interview data as the principal barrier to integration.

Triangulating the three data sources shows that they serve distinct but complementary roles: questionnaire and observation data establish the extent of limited ICT implementation, with teachers and learners reporting low implementation and ICT tools observed in only 22 of the 190 schools visited, while interview evidence from Heads of Institutions identifies the reported barriers behind this pattern, namely inadequate infrastructure and limited teacher capacity. Read together, these sources indicate that ICT integration in teaching Clothing and Textiles remains minimal, and that this limited implementation is explained by the infrastructural and capacity-related barriers reported by Heads of Institutions, despite ICT's recognised potential to enhance learner engagement.

The finding that ICT integration in Clothing and Textiles remains minimal despite its recognised motivational potential is consistent with the literature reviewed in Chapter Two. Murithi and Yoo (2021) similarly found that teachers perceived ICT facilities in schools as inadequate, a challenge mirrored in the present study's observation that ICT tools were seen in use in only 11.6% of the schools visited, while Shikomera (2024) reported that the majority of teachers lacked adequate ICT training, corroborating teachers' own low rating of how frequently they use ICT tools during lessons (Mean = 2.24).

The finding also aligns with Gesare, Aming'a and Ouma (2023), who established that teacher competency is central to effective ICT use, yet most teachers were not well equipped with the requisite skills. The findings also align with Mabuza, Dlamini and Makumane (2025), who found that although teachers hold a positive attitude towards ICT integration, they often lack proficiency in the specific digital tools relevant to the subject. This suggests that the gap between teachers' positive disposition towards ICT and its limited classroom implementation, evident in both the present study and prior research, points to inadequate infrastructure and insufficient technical training as the primary obstacles to effective integration.

The limited implementation aligns with Ruijia, Wenling and Xuemei's (2025) meta-analytic finding that ICT has a significant positive effect on learning outcomes The gap between this established potential and the minimal integration observed in the present study's schools implies that Clothing and Textiles learners are yet to benefit from gains that ICT has been shown to deliver elsewhere, reinforcing the need for targeted investment in digital infrastructure and teacher training.

While the literature broadly supports this study's findings on ICT integration, a clear research gap emerges: studies such as Mabuza et al. (2025) and Murithi and Yoo (2021) address ICT challenges generically across subjects, with little attention to Clothing and Textiles specifically or to blending ICT with practical and demonstration approaches. These studies also rarely examine resource-constrained junior school settings, leaving a gap in subject-specific evidence on how ICT can realistically support Clothing and Textiles instruction at this level.

This study addressed this gap by generating subject-specific, triangulated evidence on ICT integration in Clothing and Textiles at the junior school level, combining learner and teacher data with interview and observation findings. It therefore uniquely contributes locally grounded evidence on the gap between teachers' positive disposition towards ICT and its minimal classroom implementation. This informs targeted recommendations for infrastructure investment, teacher training, and blending ICT with existing practical and demonstration methods.

These findings align with Constructivist theory, which holds that learning is strengthened when learners actively engage with tools that help them construct and represent knowledge in new ways. Digital resources can support abstract conceptualisation, another stage in Kolb's Experiential Learning Cycle, by helping learners visualise concepts before applying them practically. However, the finding that ICT is rarely implemented suggests this potential remains largely untapped, limiting learners' engagement with technology-supported learning experiences in Clothing and Textiles.

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Summary of the Findings

The study found that ICT integration remains the least developed of the three instructional approaches examined. Both learners and teachers perceived ICT as making lessons more interesting and engaging, but this favourable view did not extend to its actual classroom implementation or to its perceived contribution to learners' understanding, creativity and practical skills, all of which both groups rated weakly. This gap between a broadly positive disposition toward ICT's motivational value and its minimal actual implementation and perceived instructional contribution was attributed principally to infrastructural shortfalls, unreliable power and connectivity, and limited teacher preparedness in digital pedagogy, rather than to any reluctance to adopt technology. The finding underscores that ICT's motivational promise in Clothing and Textiles is, for now, largely untapped, while its contribution to deeper learning outcomes remains unestablished, with the barrier lying upstream in infrastructure and training rather than in classroom attitudes.

Conclusion

The study concludes that ICT integration represents an instructional opportunity that has been recognised but not yet realised in the teaching of Clothing and Textiles. The consistent view among both learners and teachers that ICT makes lessons more interesting, set against its minimal actual classroom implementation and the weak perceived contribution to understanding, creativity and practical skills, indicates that the barrier is infrastructural and technical rather than attitudinal, and that goodwill toward digital tools alone cannot substitute for the connectivity, devices, and teacher competence needed to put them to use. This points to ICT as the area of instructional practice with the largest gap between current reality and perceived potential; whether targeted investment in infrastructure and teacher capacity would translate into improved teaching and learning of Clothing and Textiles was not directly assessed by this study, and is presented in the following sections as a recommendation and an area warranting further investigation rather than an established conclusion.

Recommendations

i. Ministry of education through county director of education: Prioritise equipping junior schools with functional digital devices, reliable electricity and internet connectivity, and organise regular in-service training for Clothing and Textiles teachers in digital pedagogy, so that ICT use moves beyond its motivational value to improved learning.
ii. Heads of institutions: Allocate available funds to acquire and maintain basic ICT resources, schedule access to them for Clothing and Textiles lessons, and support teachers' participation in digital pedagogy training, since interest in ICT is already high but its use is minimal.
iii. Teachers of Home science: Make deliberate use of accessible ICT tools such as videos and mobile devices to demonstrate practical concepts, blend them with hands-on activities, and seek continuous professional development in digital skills to turn learners' interest into understanding and practical competence.

Suggestions for Further Research

i. Conduct a longitudinal study tracking Clothing and Textiles learners over several terms after ICT infrastructure and teacher training are provided, to establish whether sustained ICT integration improves understanding, creativity, problem-solving and practical skills.
ii. Undertake comparative research across better-resourced and under-resourced junior schools, or other rural and ASAL sub-counties in Kenya, to determine whether the gap between ICT's recognised potential and its minimal implementation holds across different contexts.
iii. Investigate low-cost, context-adapted ICT options, such as offline or low-power digital tools and shared devices, to establish whether ICT use in Clothing and Textiles can improve in resource-constrained schools without relying solely on additional funding.

Conflict of Interest and Funding

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