Effectiveness of Technology-Enabled Intervention for Competency Building on Creative Commons Licenses

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Abstract
Global movement on Open Educational Resources (OER) upsurges the importance of awareness of Creative Commons (CC) licenses. OERs and Massive Open Online Courses (MOOCs) on CC licenses mostly depends on self-determination and self-motivation which remain unreachable to the mass. Present action research aimed to examine the effectiveness of a technology-enabled intervention to build competency on CC licenses. The before-and-after without control group experiment was applied to 19 trainee teachers of the M.Ed (Special) program. The intervention was designed using OERs and hyperlinks to experiment along with hands-on activities. Quizziz, Google Forms, and Padlet were used to measure the effectiveness. A significant improvement in knowledge, skills, and uprightness has been observed after applying the intervention. The study indicated that the technology-enabled intervention was truly effective to build competency on CC licenses. It is recommended that small group workshops with technology-enabled intervention may apply at the institutional level mandatorily to enhance the competency to use CC licenses properly in education by educators as well as learners.
Keywords: *action research, competency, Creative Commons licenses, effectiveness, technology-enabled intervention.*

Introduction:
Creative Commons promoted two new mindsets i.e. free culture and creative class (Fitzgerald & Oi, 2004). Creative Commons (CC) licenses were designed for creative works such as websites, scholarship, music, film, photography, literature, courseware, etc. (Broussard, 2007). Rampant use of digital content leads to CC Attribution license violations often due to unawareness (Seneviratne et al., 2009). Indian Open Educational Resources (OER) initiatives expanded in formal as well as non-formal lifelong learning sectors (Das, 2011; Khullar, 2019). Though it has extensive opportunities, the OER movement in Indian Higher Education faces lots of challenges (Dutta, 2016). A major portion of learners and educators are not aware of copyright regulations, and restrictions of open licenses (Hodgkinson-Williams et al., 2017; Reed, 2012; Upadhyay & Naskar, 2022). It is very important to understand the user's rights as well as the author's rights (Samaddar, 2008). Lack of awareness of use rights or licensing, lack of knowledge, and skills regarding how to use, and lack of training are key factors for not using OER in India (Kumar et al., 2021; Padhi, 2018). The present action research aimed to design an effective intervention to improve the knowledge, skills, and uprightness of the aspired educators.

The Rationale of the study:
With the successful expansion of the OER movement globally, awareness of CC licenses getting serious importance. There are several OERs and Massive Open Online Courses (MOOCs) to enhance knowledge and skills for those who eagerly want to enrich themselves. However, the process is mostly depending on self-determination and self-motivation. Mass success in generating awareness about CC licenses

remained unreachable due to such types of constraints. In this context, it is very important to initiate and implement an innovative intervention to build competencies not voluntarily but compulsorily among the educators as well as learners as they become capable to use and create resources under CC licenses. Teacher educators play an important role to spread culture among learners through teachers. This action research was conducted to examine the effectiveness of technology-enabled intervention applied to the M.Ed. trainees.

Objectives:
To study the effectiveness of the technology-enabled intervention to build competency on CC licenses the following objectives were laid down –
1. To find out the differences in knowledge about CC licenses among the trainees after and before intervention.
2. To find out the differences in comfort level to use CC licenses among the trainees after and before intervention.
3. To find out the differences in uprightness towards CC licenses among the trainees after and before intervention.

Hypothesis:
The following hypotheses were framed to test the objectives -
[1]H_0– There is no significant difference in knowledge about CC licenses among the trainees after and before intervention.
[2]H_0– There is no significant difference in comfort level to use CC licenses among the trainees after and before intervention.
[3]H_0– There is no significant difference in uprightness towards CC licenses among the trainees after and before intervention.

Methodology:
Study area: The action research has been conducted a Netaji Subhas Open University, Kolkata, India. The intervention strategy was applied to pre-service trainees of the M.Ed (Special Education) program.
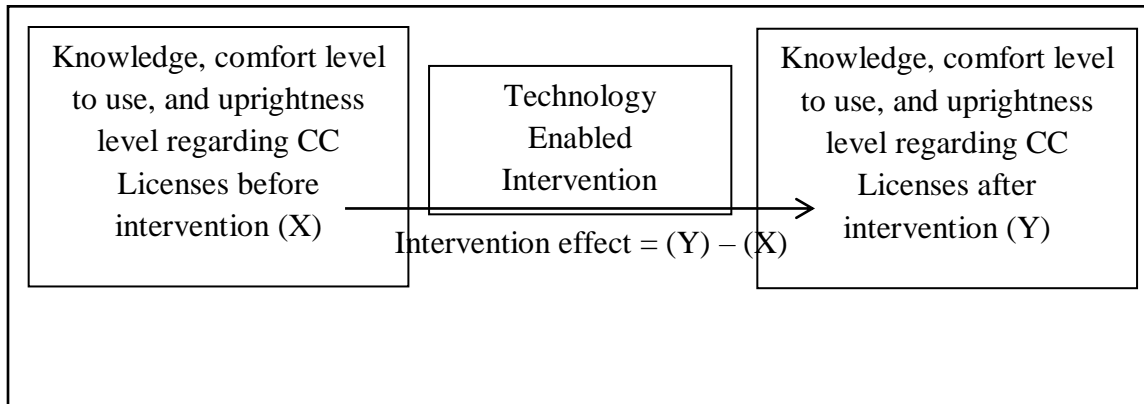
Variables: Three independent variables were considered for the study as follows –
1. Knowledge about Creative Common Licenses
2. Comfort level to use Creative Common Licenses
3. Uprightness towards Creative Common Licenses

Samples: The experiment was conducted on 19 pre-service trainees of the M.Ed (Special Education) program in Netaji Subhas Open University, Kolkata among whom 6 were male and 13 were female. The trainees were from across India.

Tools: Different ICT tools were used to measure the knowledge, comfort level to use, and uprightness regarding Creative Common Licenses. Quizizz (https://quizizz.com) tool was used to assess the knowledge level of the trainees about CC Licenses. Google Forms (https://docs.google.com/forms) was used to collect data about comfort level to use and uprightness regarding Creative Common Licenses. Padlet (https://padlet.com) tool was used for evidence-based assessment of their comfort level to use CC Licenses. The knowledge assessing tool was constituted of 10 MCQ questions with 4 options. The score was calculated based on the correct answer as well as the time taken to submit. For assessing comfort level to use CC Licenses 6 items with 2 options were included and the trainees were instructed to post their products on padlet. Five points Likert scale with five items was used to assess their uprightness toward CC Licenses.

Experimental Design: In this action research before-and-after without control design has been adopted for a single test group. There was only an experimental group, and no control group (Kothari, 2004). Pre-survey has been conducted before introducing the intervention. After applying the intervention post-survey was conducted. The design was as follows –

Knowledge, comfort level to use, and uprightness level regarding CC Licenses before intervention (X)

Technology Enabled Intervention

Intervention effect = (Y) – (X)

Knowledge, comfort level to use, and uprightness level regarding CC Licenses after intervention (Y)

Intervention Design: The technology enabled Intervention was designed based on ten thrust areas of CC Licenses which are –
1. CC Licenses – Concept & context
2. Rights under CC Licenses & Icon identification
3. CC Licenses – Types
4. CC Licenses & 5R activities
5. OER under CC Licenses – Searching tools & techniques
6. Remixing OER under CC Licenses
7. Selecting CC Licenses for own creation
8. Selecting adapter's licenses
9. Building attribution
10. Sharing OER under CC Licenses

The intervention was developed in the form of slides enriched with resources under CC Licenses with proper attribution. Contents were prepared with required hyperlinks as live demonstration is possible. Different ICT tools were incorporated into the demonstration.

Data Collection: Data were collected from the members of the experimental group in two stages. The live Quizizz link and Google Forms questionnaire link was disseminated in the WhatsApp group before introducing the intervention. This pre-survey was conducted to assess previous knowledge, skills, and uprightness. After applying the intervention data were collected through the live Quizizz link, Google Forms questionnaire link, and Padlet post link.

Data Analysis: The collected data has been analyzed quantitatively. The knowledge about CC Licenses of the trainees has been analyzed based on their accuracy level concerning ten aspects of knowledge about CC Licenses. It has been observed that the accuracy rate for knowledge about icon identification (11% to 60%), types of CC Licenses (16% to 50%), general searching (16% to 70%), specific searching (22% to 45%), remixing (55% to 65%), adapter's license selection (16% to 35%), attribution (50% to 65%), restrictions (22% to 55%), 5R activities (33% to 70%), and concept (27% to 59%)increased significantly after applying the intervention (Figure-1). The overall accuracy rate increased from 27% to 59% after the intervention. A paired sample t-test was performed by using IBM SPSS Statistics 20 based on the score of the quizzes to test the hypothesis. The score of the quizzes auto-generated based on correct answers and the time taken to submit the answer. There

was a significant difference in knowledge about CC Licenses between the score after (M = 4837.37, SD = 1638.05) and before (M = 2091.05, SD = 1733.445) intervention; t (18) = 13.321, p = .000 (Table – 1). The result indicated that the technology-enabled intervention was truly effective to improve the knowledge level about CC Licenses.

The comfort level of using CC Licenses of the trainees has been recorded based on their perception in six dimensions. It has been observed that comfort level in searching resources under CC Licenses (31.58% to 84.21%), remixing resources under CC Licenses (21.05% to 78.95%), selecting CC Licenses for adapted resources (26.32% to 78.95%), building attribute (26.32% to 68.42%), selecting CC Licenses for original work (36.84% to 84.21%) and sharing resources under CC license (26.32% to 68.42%) increased significantly after applying the intervention (Figure-2). The data has been confirmed with the post in padlet by the trainees after completion of their assigned tasks. Paired sample t-test depicted that there was a significant difference in comfort level to use CC Licenses between the score after (M = 4.63, SD = 1.71) and before (M = 1.68, SD = 2.11) intervention; t (18) = 5.13, p = .000. It has been also observed significant differences between the scores of after and before for each of sex dimensions i.e. searching (t = 3.29, p = 0.004), remixing (t = 4.16, p = 0.001), selecting adapter's licenses (t = 4.47, p = 0.000), building attribute (t = 3.02, p = 0.007), selecting a license for original works (t = 3.38, p = 0.003) and sharing (t = 2.65, p = 0.016) (Table – 2). The result indicated that the technology-enabled intervention was truly effective to enhance the comfort level to use CC Licenses.

The uprightness towards academic integrity as well as the use of CC Licenses has been also improved. Paired sample t-test depicted that there was a significant difference in uprightness between the score after (M = 20.95, SD = 2.35) and before (M = 15.47, SD = 2.97) intervention; t (18) = 6.66, p = .000. The result indicated that the technology-enabled intervention was truly effective to improve the uprightness of the trainees (Table – 3).
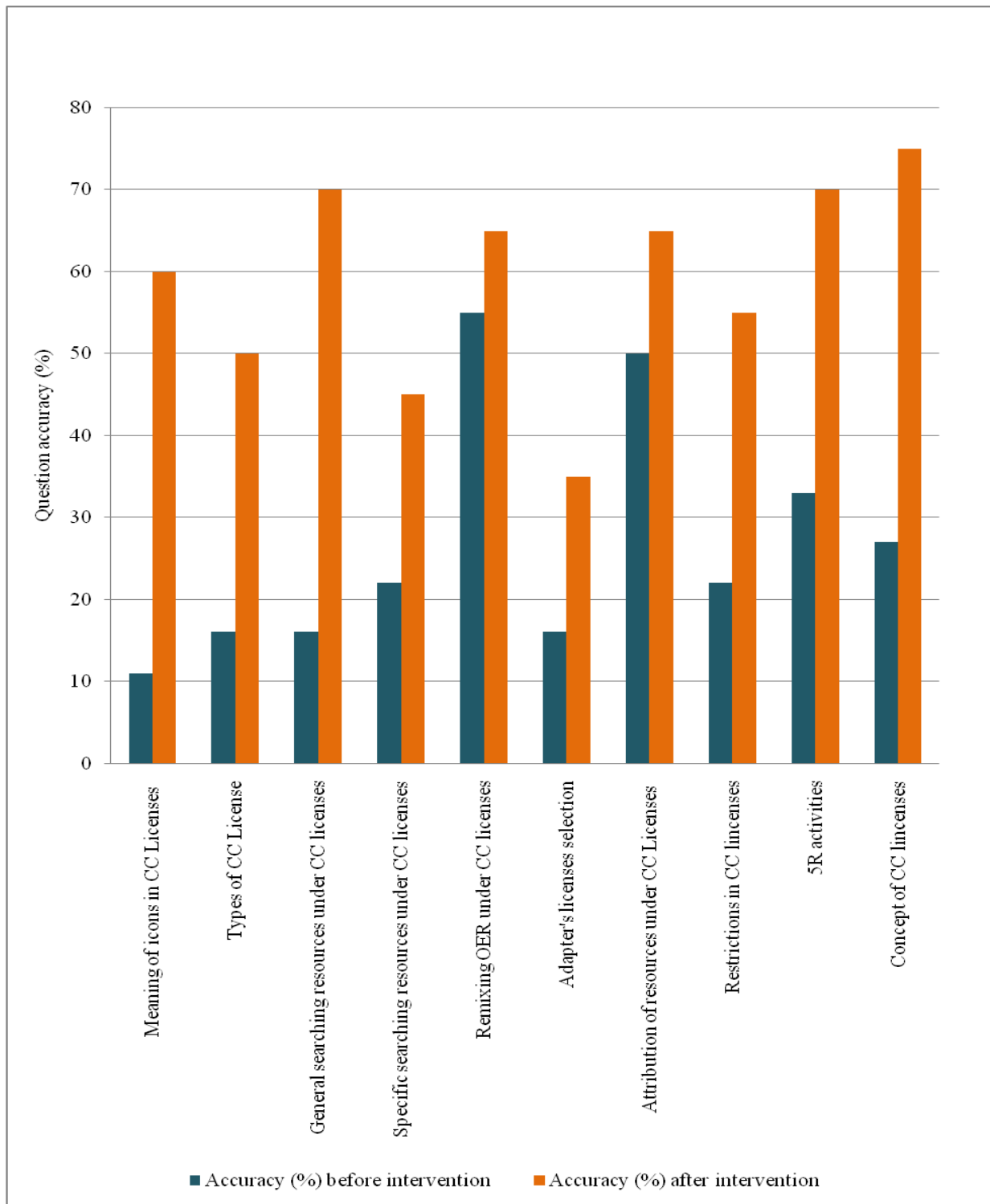
Figure – 1: Knowledge about CC Licenses of the trainees after and before the intervention

Table – 1: Paired Samples t-test between knowledge scores after and before intervention

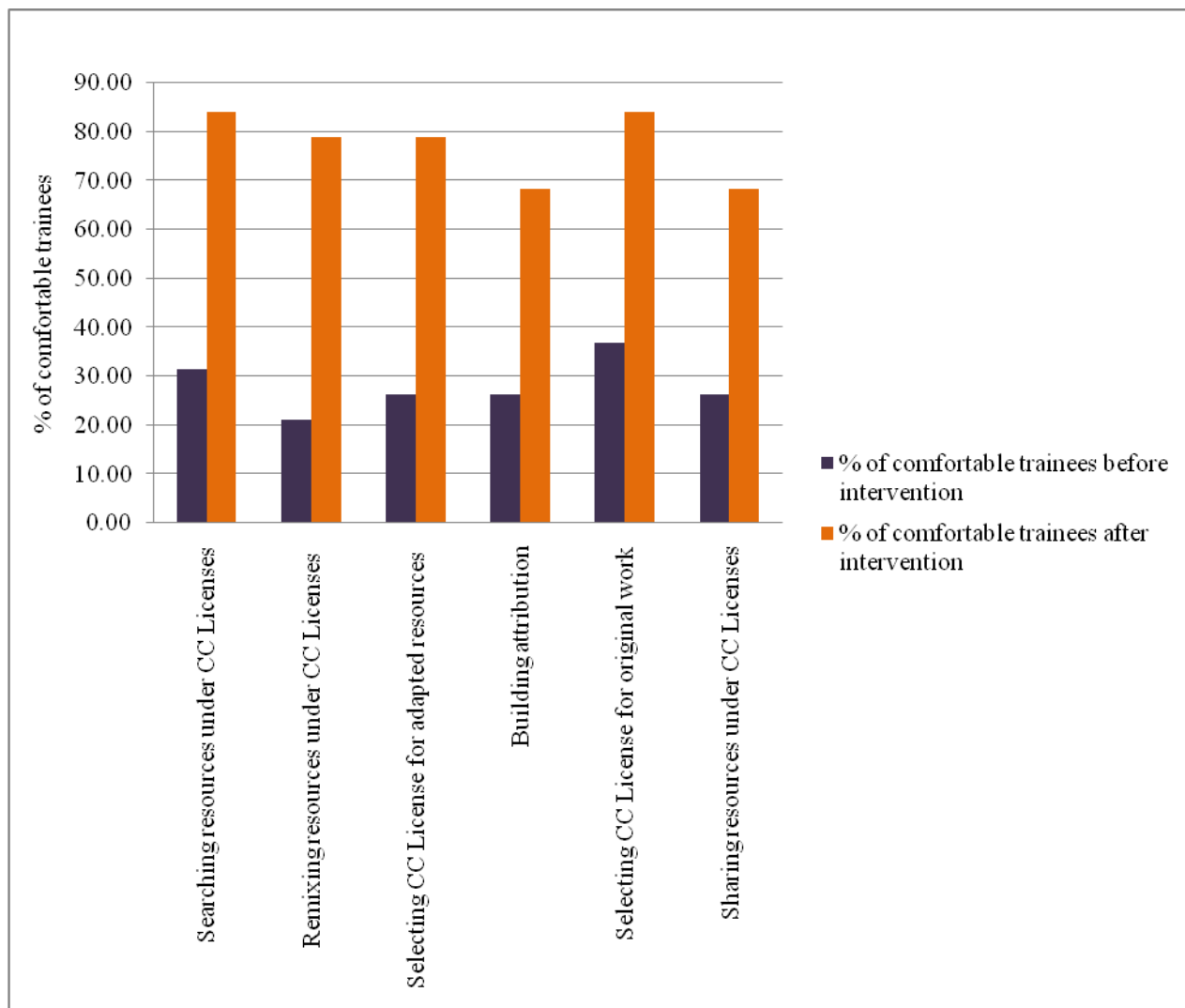| | Paired Differences | | | | | | | |
				95% Confidence Interval of the Difference				Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	
Pair 1 Knowledge score after intervention - Knowledge score before intervention	2746.316	898.679	206.171	2313.166	3179.465	13.321	18	.000

Figure – 2: Comfort level to use CC Licenses of the trainees after and before the intervention

Table – 2: Paired Samples t-test between comfort level scores after and before intervention

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Searching resources under CC Licenses after intervention - Searching resources under CC Licenses before intervention	.526	.697	.160	.191	.862	3.293	18	.004
Pair 2	Remixing resources under CC Licenses after intervention - Remixing resources under CC Licenses before intervention	.579	.607	.139	.286	.872	4.158	18	.001
Pair 3	Selecting CC License for adapted resources after intervention - Selecting CC License for adapted resources before intervention	.526	.513	.118	.279	.774	4.472	18	.000
Pair 4	Building attribution after intervention - Building attribution before intervention	.421	.607	.139	.128	.714	3.024	18	.007
Pair 5	Selecting CC License for original work after intervention Selecting CC License for original work before intervention	.474	.612	.140	.179	.769	3.375	18	.003
Pair 6	Sharing resources under CC Licenses after intervention - Sharing resources under CC Licenses before intervention	.421	.692	.159	.087	.755	2.650	18	.016

Pair 7	Comfort-level Score after intervention - Comfort-level Score before intervention	2.947	2.505	.575	1.740	4.155	5.129	18	.000

Table – 3: Paired Samples t-test between uprightness score after and before intervention

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Uprightness score after intervention - Uprightness score before intervention	5.474	3.580	.821	3.748	7.199	6.664	18	.000

Discussion:
After analyzing, designing, developing, implementing, and evaluating the technology-enabled intervention, it has been observed that the intervention influenced the knowledge, skills, and uprightness regarding CC licenses of the trainees. The knowledge about icon identification, types, general searching, specific searching, adapter's license selection, attribution, restrictions, 5R activities, and overall concept regarding CC licenses have been changed positively and significantly after applying the intervention. The comfort level for searching, remixing, selecting adapter's licenses, building attributes, selecting licenses for own original works, and sharing has been enhanced. The uprightness of the trainees towards academic integrity also has been changed positively. This technology-enabled onsite intervention had a great influence to build competency for using CC licenses.

Implication:
The action research ascertained that technology-enabled face-to-face small grouped intervention can overcome the constraints of self-determination and self-motivation of the educators as well as learners to build competencies for using CC licenses. This intervention strategy will be very effective if it is implemented at the institutional level.

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