eLearning to empower front-line nutrition workers in India

ARCHANA SARKAR, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), New Delhi
NADINE BADER, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), New Delhi
NEHA KHARA, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), New Delhi
NISHA JAIN, Department of Women and Child Development, Madhya Pradesh
URFAT ANJEM MIR, Ambedkar University, New Delhi
KALINDI SHARMA, Amity University, New Delhi
GERRIT QUALITZ, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), New Delhi

Contact the authors at: archana.sarkar@giz.de

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ABSTRACT

In February 2019, the FaNS Project and the Department of Women and Child Development of Madhya Pradesh, India, implemented an interactive eLearning platform to provide high-quality, systematic and standardized training to boost the nutrition knowledge and counselling skills of 97 135 front-line workers and supervisors. To date, 25 000 have embarked on the 40-hour training course and 7 000 have completed it. A study was conducted in December 2019 to analyse the effects of this digital tool on the capacity-building of front-line workers, using a quasi-experimental study. The sample comprised 205 front-line *Anganwadi*[1] workers and their supervisors. Ninety-nine percent of participants claimed to have benefited from the training and said that it had enhanced their nutrition knowledge and counselling skills. The course was said to be comprehensive, systematic and suited to participants' roles and responsibilities. Recommendations from the study included the need to address implementation challenges, such as platform accessibility and communication gaps in orientation and technical support.

INTRODUCTION AND BACKGROUND

The state of Madhya Pradesh is located in Central India, with nearly 75 million inhabitants and a sizeable population of Scheduled Castes and Tribes (Ministry of Social Justice and Empowerment (2017). Seventy-two percent of the population is rural (Office of the Registrar General & Census Commissioner, India, 2011). According to India's Comprehensive National Nutrition Survey (2016–18), 39.5 percent of children under the aged of five in Madhya Pradesh are stunted and 19.6 percent are wasted (Ministry of Health and Family Welfare and IIPS, 2017). The Gesellschaft für Internationale Zusammenarbeit's (GIZ) Food and Nutrition Security, Enhanced Resilience (FaNS) project in India is part of the German Federal Ministry for Economic Cooperation and Development's (BMZ) global "One World – No Hunger" special initiative (GIZ, n.d.; BMZ, 2018). FaNS aims to improve the food and nutritional situation of 144 000 women of reproductive age and 30 000 small children (aged 6–23 months) in two of the state's districts.

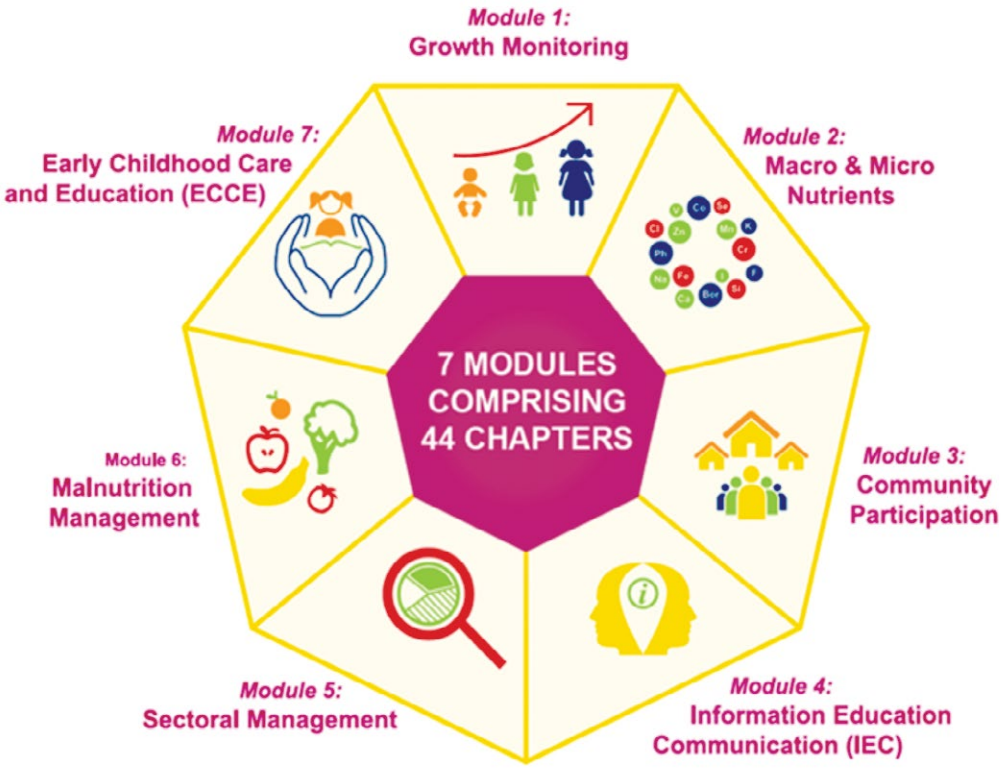
Anganwadi workers (AWWs) – more than 97 000 female front-line staff of the State Department of Women and Child Development (DWCD) across Madhya Pradesh – play a key role in reaching out to women in villages, transferring

1 An *Anganwadi* (meaning "courtyard shelter") is a type of rural women and child-care centre established by the Indian government in 1975 as part of a programme to combat child hunger and malnutrition.

nutrition knowledge and encouraging behavioural change to good nutrition and hygiene practices. They are recruited directly from villages by DWCD. However, AWWs often have knowledge gaps on nutritional topics, such as complementary feeding or malnutrition management, and lack counselling skills. The DWCD gives them an initial, 26-day residential induction course at training centres when they start, with refresher training sessions every two years. In these traditional classroom settings, they learn about their roles and responsibilities, as well as woman and child health/nutrition entitlements under existing policies and schemes. AWWs are responsible for the health/nutrition of women and children, for example, by providing hot, cooked meals for preschool children aged 3–6 years at local *Anganwadi* centres, monitoring children's growth, conducting home visits to counsel or to provide take-home rations for pregnant women and children under three years of age. With so many daily duties, they lack access to structured and standardized (further) training possibilities, especially in remote locations. Furthermore, their educational levels vary, from primary schooling to graduate education. High-quality, standardized, in-depth training is lacking.

To fill this gap, the FaNS project, together with the DWCD in Madhya Pradesh, developed an interactive eLearning training platform, called *Anganwadi Shiksha*, to systematically build the capacity of the state's AWWs. *Anganwadi Shiksha* consists of structured, self-paced learning content in seven modules, divided into 44 chapters. The content is a compressed version of the DWCD's extensive classroom training. Topics include growth monitoring, macro- and micronutrients, malnutrition management, information education and communication (IEC), early childhood care and education, community participation and sectoral management (for supervisors) (Figure 1). Counselling skills are integrated into all topics. The eLearning course has engaging visuals, quizzes and narrations in a simple form of Hindi. The animated visuals are culturally appropriate in terms of local-community scenes, AWW dress code, local dialect, food groups and cuisines. Even illiterate AWWs can complete the course, as it is completely audio-visual. The software is open source, with 40 hours of learning and certification by the DWCD upon course completion.

Figure 1. STRUCTURE OF THE ANGANWADI SHIKSHA eLEARNING COURSE



Source: *FaNS Project (2017)*

The platform has been integrated into the state DWCD management information system (MIS) to ensure institutionalization and ownership by the Department. This also offers the opportunity to track the learning status of the AWWs enrolled across the state through a live dashboard. The MIS is accessed monthly by the AWWs and more than 3500 supervisors through computers, tablets or smartphones.

The rollout of Anganwadi Shiksha across Madhya Pradesh began in February 2019. In collaboration with the DWCD, the FaNS project undertook an orientation course in April and May 2019 for supervisors and their district-level line managers to ensure widespread enrolment. As of January 2020, 25 000 AWWs and supervisors had started the course and 7 000 had completed it. The DWCD has made the training mandatory for AWWs. *Anganwadi Shiksha* could benefit more than 97 000 AWWs in Madhya Pradesh and has the potential to reach 1.4 million AWWs in other states across India.

Over the past two decades, web-based learning interventions have shown positive results in enhancing workers´ knowledge, improving communication skills, decreasing the workload of health staff and enhancing workers' ability to manage and recall records (Sukums et al., 2014; Borkum et al., 2015; Bondale et al., 2013; Hong et al., 2011; Khatony et al., 2009; Darbyshire, 2004). There has been a rise in the number of digital interfaces and platforms for assistance, but there are few studies evaluating their performance and how users perceive them.

Consequently, a quasi-experimental study of *Anganwadi Shiksha* was conducted in December 2019 to analyse the platform's ease of use, its boost to knowledge and the improvement in counselling on nutrition-relevant topics. The study also aimed to document challenges to the rollout and long-term implementation of the platform in the state and to provide recommendations for improvement.

METHODOLOGY

A mixed-method study was used to collect data in two districts of Madhya Pradesh (Hoshangabad and Shivpuri). The participants were 105 AWWs who had completed the eLearning training modules (intervention group) and 100 AWWs who had not been exposed to eLearning platform at the time of data collection (control group). The chosen districts were suggested by the DWCD and were comparable in terms of population characteristics. A random sampling was undertaken in Excel, using the list of AWWs from the DWCD dashboard, in which every third name was selected for the intervention or control groups.

Tools used to collect the data included:

- **Quantitative questionnaires** (n=105 intervention, n=100 control), with themes to capture information on: sociodemographic information, training needs, ease of use and relevance of the eLearning platform, challenges, achievement of the intended objective, (retention of) knowledge, counselling skills, etc.
- **in-depth interviews** with nine supervisors and two district-level officials (n=11) to understand perceptions and challenges and the facilitator´s role in the implementation and scale-up of Anganwadi Shiksha
- **focus-group discussions** (FGDs) (n=6), comprising 6 8 AWWs each, to gain in-depth insights into their perceptions, problems and views on usefulness and gains in terms of knowledge and skills.

The quantitative questionnaire was pre-tested and the research team was trained. The questionnaire was developed in English and translated into Hindi, then translated back into English to ensure reliability. Discussions were held with data collectors to check translated meanings. Informed written consent for audio recording was obtained from all participants.

For the quantitative analysis, the data were entered and analysed in IBM SPSS Statistics version 24. Descriptive frequencies and group comparisons were carried out between the intervention and control groups. Chi-square and t-tests were performed for key statistics. The qualitative data were analysed using qualitative content analysis; the researchers then refined this data manually. The audios of interviews were transcribed and translated from Hindi to English, then entered manually.

RESULTS

Sociodemographic data of Anganwadi workers

The age of the 205 AWWs ranged from 23 to 61 years. On average, they had been working with the DWCD for around 12 years at the time of the study, both in the intervention and the control groups. Most participants belonged to socially disadvantaged populations, as defined by the Government of India, namely, Scheduled Castes or Tribes (Ministry of Social Justice and Empowerment, 2017). In terms of educational qualifications, 68 percent of intervention-group participants and 42 percent of control-group participants were graduates (mainly of the social sciences). Only 11 percent of the control group and 8 percent of the intervention group were educated up to eighth class (the last class before high school), while 18 percent and 3 percent, respectively, had schooling to less than eighth class (Table 1).

Table 1. SOCIODEMOGRAPHIC BREAKDOWN OF FRONT-LINE WORKERS

Variable	Intervention group (%) (n=105)	Control group (%) (n=100)
Age (average, years)	40	40
Length of service (average, years)	12.3 ± std. dev. 6.4	12.4 ± std. dev. 6.4
Educational qualification (university graduate)	67.6%	42.0%
Social category (Scheduled Caste (SC), Scheduled Tribe (ST) and Other Backward Castes (OBC), per the Government of India classification (Ministry of Social Justice and Empowerment, 2017)	OBC = 47.6% SC and ST= 16.2%	OBC = 36% SC and ST= 19%

Awareness of roles and responsibilities and reported training needs

The eLearning platform helped intervention-group participants acquire increased knowledge on key issues. Completion of the course led to far better awareness of roles and responsibilities in certain areas, such as counselling on breastfeeding (p value: 0.034) and community participation (p value: 0.022) (Table 2).

Among control-group participants, as expected, reported training needs were high: 72 percent reported facing difficulties in performing their job in the field and 97 percent said they would be better equipped in the field if they received more knowledge of nutritional management and enhanced counselling skills.

Table 2. LEVEL OF AWARENESS OF ROLES AND RESPONSIBILITIES

Variables	Group	Mean ± std. dev. (SD)	t	Sig (p value)
Providing health & nutrition education for women and children	Intervention	3.5 SD 0.60	0.266	0.221
	Control	3.5 SD 0.67		
Counselling on breastfeeding	Intervention	3.9 SD 0.35	1.017	0.034
	Control	3.80 SD 0.44		
Home visits	Intervention	3.77 SD 0.44	0.484	0.312
	Control	3.74 SD 0.48		
Encouraging community participation	Intervention	3.67 SD 0.49	1.012	0.022
	Control	3.60 SD 0.58		

Perceived effects of the eLearning course

Content, language and visuals

Most AWWs and their supervisors agreed that the content of the eLearning platform was comprehensive, systematic and in line with their roles and responsibilities. Sixty-four percent said the information provided on the platform went into greater detail than classroom training. Ninety-two percent of the participants said the content was easily understood and 99 percent said the language was comprehensible. Ninety-eight percent of the intervention group said the videos and graphics were locally apt, culturally appropriate and relatable. According to one focus-group participant:

> *"I felt good when I took the training. I felt that I have understood everything, and I have gained good amount of experience about what I am supposed to do, that in the morning which house am I supposed to visit. Basically, I also understood what kind of counselling should be given to women."*
> (AWW, Hoshangabad district)

Enhancement of knowledge and counselling skills through eLearning

More than 65 percent of AWWs reported that they had acquired nutrition knowledge and counselling skills in all key areas, such as effectively delivering messages on infant and young child feeding practices, nutritious and diverse food preparation and hygiene practices, growth monitoring, behavioural change at household level, and strategies and techniques to mobilize community participation (Table 3). They also said they had acquired soft skills, such as the effective use of IEC materials, asking open-ended questions, greeting family, empathy for mothers in different contexts, etc. These skills are the primary responsibilities of AWWs. Overall, the participants rated the eLearning training very highly, with 42 percent ranking it as "good" and 53 percent declaring it "excellent".

Table 3. COUNSELLING SKILLS ACQUIRED BY SAMPLE-GROUP PARTICIPANTS

Skill	n	Level acquired	% (n)
Effectively deliver messages on early initiation of breastfeeding during home visit	102	Little to none	10.78 (n=11)
		Moderate	21.56 (n=22)
		Sufficient and significant	67.64 (n=69)
Effectively deliver messages for social behaviour change communication	102	Little to none	7.84 (n=8)
		Moderate	13.72 (n=14)
		Sufficient and significant	78.42 (n=80)
Mobilize community participation to create awareness of the importance of nutrition-related schemes	100	Little to none	8 (n=8)
		Moderate	17 (n=17)
		Sufficient and significant	75 (n=75)
Give oral presentations confidently and convincingly to mothers about Integrated Child Development Services programme benefits	100	Little to none	7 (n=7)
		Moderate	13 (n=13)
		Sufficient and significant	80 (n=80)

Most of the AWWs and supervisors said the eLearning content enhanced their skills, especially with regard to growth monitoring and plotting. In a focus-group discussion, several participants noted that the practical demonstrations of height and weight measurements in course videos were very informative and had increased their knowledge.

> "*I did the first module on growth monitoring and, in that, I could revise several topics. Generally, we leave some sections/ topics, or we don't remember them, but these modules allowed us to revise our knowledge from the beginning.*"
> (Focus-group discussion participant, Hoshangabad)

The participants found the IEC module quite useful in building their counselling skills. They agreed that such modules enhanced their personality and gave them the necessary skills to talk confidently with beneficiaries.

In the control group, several gaps were identified in terms of knowledge and counselling skills. Control-group participants cited knowledge and skills deficits when it came to micro- and macronutrients, counselling techniques using different IEC tools – only 43 percent and 56 percent reported having sufficient knowledge, respectively. Intervention-group participants suggested that topics such as the health management of adolescent girls and the counselling of men and women in the family, especially with regard to nutrition rehabilitation-centre admissions for malnourished children and the appropriate way of using a standometer and pedometer, should be included on the eLearning training platform.

User-friendliness of the eLearning platform

Most intervention-group participants described progression from one module to another, the Hindi voice-over and the login system as user-friendly, though 42 percent reported difficulties with login.

After completing each module, the AWWs answered questions to assess their learning. The respondents felt this was a useful feature. One AWW said it helped her to identify topics where she needed to boost her knowledge or revise:

> *"Because I liked solving the questions in the modules and in case my answers were wrong, I could realize where all I was making mistakes and it made us aware about our weakness."* (Anganwadi worker, Hoshangabad)

In terms of mobile-phone use generally, it was found that 98 percent of the intervention group and 95 percent of the control group could use some, most or all functions. Only 2 percent of the intervention group and 5 percent of the control group could not use the phone by themselves. However, front-line workers in the intervention group reported seeking help from a family member to access the platform and learn from it. The eLearning platform was reported to be easy to manoeuvre for most of the intervention-group AWWs and their supervisors in Shivpuri district during focus-group discussions, as they had been working with mobile technology for the previous two years. The government had also given them a month-long general computer training course. However, their familiarity with the features of the eLearning system was limited to modules and assessment questions, so further reinforcement on the platform is needed to ensure the AWWs retain the content.

Issues with implementation

The supervisors mentioned that orientation on the eLearning programme was provided to them just once in April/May 2019 and that an intensive orientation programme would have helped them to become more familiar with the platform. Furthermore, the central government held a seven-hour classroom refresher course for AWWs and their supervisors during data collection. They compared this monthly course with the one-day eLearning orientation that had taken place in April/May 2019 and found the monthly hand-holding support to be more helpful. Moreover, a local training agency had been hired by the DWCD to conduct the district-level eLearning orientation across Madhya Pradesh in April/May 2019, but the study participants did not perceive this local agency to be conducting the orientation on its behalf.

Sixty-two percent of the intervention group and 69 percent of control-group participants reported good network connectivity at their place of residence. Sixteen percent of the intervention group and 7 percent of the control group said there was no internet connectivity at the local health centre. Apparently, it was not communicated effectively that the eLearning training was available offline. Many participants reported having experienced technical difficulties, ranging from problems with sound and video and internet connectivity to a few incorrect answers to the questions (due to a technical error, resolved after pilot-testing). Most AWWs and their supervisors were not aware of the feedback feature in the platform to give their suggestions for improvements.

Five percent of the intervention group and 8 percent of control-group participants did not possess a smartphone. Intervention-group participants who did not have a smartphone completed the programme using the mobile phone of a relative or front-line co-worker.

Furthermore, there was an assumption among intervention-group participants that they had a limited time in which to complete modules and assessment questions, highlighting the need for better communication with participants.

Preference for eLearning over classroom training

Sixty-five percent of participants said it took them less effort to learn using the eLearning platform, while 61 percent said they acquired more knowledge and skills than in other training programmes. Sixty-five percent of participants said they preferred eLearning to other modes of training.

Seventy-two percent of control-group participants said the eLearning platform would be more convenient and useful for front-line workers. Sixty percent of the control group considered it to be greatly beneficial and 14 percent said it was beneficial to some extent. Ninety-two percent of control-group participants expressed interest in undergoing the eLearning training. The remaining 8 percent of control-group participants considered existing training programmes sufficient and were not confident about training through eLearning.

DISCUSSION AND CONCLUSION

The purpose of the eLearning training platform is to offer AWWs and their supervisors standardized training to enhance their counselling skills, so as to promote good nutrition practices among mothers, not to replace classroom training.

The study showed that the eLearning course could fill a capacity-building gap and enhance the knowledge and skills of front-line workers, as the content and language were found to be comprehensive, systematic and beneficial to participants, helping them to fulfil their roles and responsibilities at village level. The content of the eLearning training was appreciated by the learners, as it was visual and local-scenario based. The information provided on the eLearning platform was deemed to be more detailed than that received in classroom training. It can be easily used to enhance both the knowledge and skills of front-line workers.

In terms of challenges to rollout and long-term implementation, the study's findings indicate that there is still a need to systematically address implementation gaps, especially communication at the last mile. For instance, the eLearning platform has a live dashboard with a feedback mechanism, but it needs to be better promoted and used. Logistical implementation challenges need to be discussed with the DWCD for a smooth scale-up. This includes internet connectivity and the availability of smartphones for AWWs from the government. It is also important to address the motivational role of supervisors in supporting AWWs to use the platform and disseminate the correct information. For instance, there was an instance of incorrect information is being circulated by supervisors to motivate AWWs to register and complete the eLearning course within a given period of time.

So far, a local training agency has organized one orientation programme in each of the 52 districts of Madhya Pradesh on behalf of the DWCD. Even though these courses were conducted on government premises (which provided the necessary infrastructure, such as computers and internet connectivity), supervisors said the orientation infrastructure did not sufficiently meet training requirements. It is, therefore, recommended that further orientation courses be conducted for supervisors and that a user-friendly manual be provided to encourage efficient use of the eLearning platform. Another important lesson for eLearning training was that orientation programmes should be carried out more frequently, directly by government officials and in a coordinated way to avoid duplication of effort and confusion.

While digital technology continues to gain momentum, there are challenges that still need to be addressed. This applies, too, to the eLearning platform for AWWs and their supervisors.

The findings of this study suggest that the platform has excellent potential for upscaling to meet the training needs of front-line workers across India. It provides an opportunity to train front-line workers with a minimum of resource mobilization and to ensure quality training through a medium that front-line workers find interesting. Useful next steps could include the creation of a knowledge-sharing system and improvements to the grievance-redressal mechanism for front-line workers and their supervisors. A further study on operational feasibility would support the upscaling of the eLearning platform.

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