

# Systematic Literature Review: ICT Education for Girls and Women in Rural Africa

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## ABSTRACT

The purpose of this review was to get an overview of the current literature available about ICT education for women in rural Africa. This has been done with a systematic literature review. The research questions important for this review are focusing on the current state of ICT education for women in rural Africa, the opportunities to improve on this current state, and the challenges that could influence the quantity of the improvements that could be made. The results showed that the ICT usage and education needed for this is small under the African women. The results also provided a need for ICT to improve the information access for women on different fields. They need education, especially about how to use and maintain different ICTs. But there are different challenges which could be limitations to the opportunities for women and their ICT usage in rural Africa.

**Method** The search query *allintitle: Africa ICT women* was used to execute a systematic literature review. Google Scholar gave in total 29 results.

**Results** In total 8 literature results were useful for the literature review according to the inclusion and exclusion criteria.

The idea that ICT is important for women started with the feminism movement. The results say that the education on ICT is not how it should be. Women in Africa have an information need on multiple subjects, for example health. They need to overcome the different challenges, for example the literacy problem and the self-esteem problem to ensure that ICTs can be used and will be maintained by women in rural Africa.

**Conclusion** A broad search query is used, but this obtained not that many results. The useful results give an overview of the current situation, opportunities and challenges. However, more focus on solutions and how to develop on ICT for women in rural Africa would be of value.

## 1 INTRODUCTION

The world is more connected than ever before. The upcoming field of ICT helped the whole world being connected. Globalization is causing an ongoing increasing development on ICT around the world, but some places are heading back.

ICT is an important aspect within the twenty first century. Companies and individuals around the world are focusing on developing on this field, but the rural places cannot head up. The more privileged continents are trying to help the rural areas, for example rural Africa, to help them with ICT. This will help them to improve their current situation on different fields.

ICT4D is helping rural places to develop themselves with the help of ICT solutions. These solutions are especially used by men living in these areas. The differences between ICT usage of men and women

are extremely high. This is not only the case in rural Africa, but this is occurring everywhere around the world. In total 7 million people work in the ICT sector, but only 30% of these 7 million people are women [6]. This problem is even bigger in rural Africa, because women are also encountering a bigger problem of literacy [11]. This and the idea that the women is there for the household is not helping with ICT development for women. The main focus is on the men, but how is the situation for women in rural Africa? Do they use ICTs? What is their situation focusing on ICTs usage and education on how to use these technologies and how to maintain them to improve their quality of life?

## 2 METHOD

This part provides an overview on how the systematic literature review is conducted. This section is divided into different subsections which will give an overview of the research question, how is searched for literature, which literature is useful and which literature will be excluded.

### 2.1 Research Questions

In the research the following main research question will be answered:

- How are girls and women in rural Africa educated in the field of ICT?

The sub-research questions that are important in this research are:

- What are the opportunities for ICT education for African girls and women?
- What are the challenges for ICT education for African girls and women?

### 2.2 Search Process

The literatures that will be used for this review are articles and books. To find the results a search query is used in Google Scholar: *allintitle: Africa ICT women*

This search query is giving 29 results.

### 2.3 Inclusion and Exclusion Criteria

Literature is only used if they are focusing on minimal one of the following subjects:

**Inclusion criteria:**

- (1) **IC1:** Focus on opportunities in ICT for rural Africa.
- (2) **IC2:** Focus on challenges in ICT for rural Africa.
- (3) **IC3:** States the steps taken for girls and women in ICT for rural Africa.
- (4) **IC4:** Defines the current state of ICT development education for girls and women in rural Africa.

- (5) **IC5:** States the kind of ICT education and training options for girls and women in rural Africa.

Literature is excluded if they follow the following criteria:

**Exclusion criteria:**

- (1) **EC1:** Literature is not used if only the abstract of the article or book is available.

After the result analysis another exclusion criteria was used. Also book reviews are not used. Another criterion is added:

- (2) **EC2:** Literature is a review of another article or book.

### 3 RESULTS

After using the search query 29 results were found. Out of these 29 results in total 8 met the criteria and are therefore useful for the systematic literature review. In Appendix A is a table shown with an overview of all the reviewed literature based on the inclusion and exclusion criteria. Literature that was provided multiple times by the search query has a line through the row.

#### 3.1 Current state

Niebla stated that the upcoming radical feminism movement brought the idea that the differences in the use of ICT and education based on gender are unnecessary [12]. This idea started the current ICT development for women. There are several projects started because of this to improve the situation for women in Africa. An example of this is the Uganda Network of Nigeria's Fantsuam Foundation [12]. They are using sms and the radio for a better connection of the continent. The radio is also used to host training of internet usage. These kinds of education are hardly needed, because Wafula-Kwake and Ocholla did a survey with over 400 women in Kenya and South-Africa [13]. They identified that 34% of the women had basic education and 10% had no education at all [13]. The women who are trying to educate themselves are using different kind of sources. They are mainly using the radio, television and telephone [13]. These information providers could also be helpful in field of opportunities on increasing the education level for women in Africa. According to Niebla there are new possibilities for African women, but the biggest problems rely in the access of these ICTs solutions and the finance aspect [12].

Ajumobi and Kyobe is also talking about the previous mentioned ICT devices used. They state that the main modern ICTs that are used in rural Africa are for example the mobile phone and the computer with internet [2]. Especially, women entrepreneurs are mainly using these kinds of ICTs in comparison with the whole women population in rural Africa. The current state for these entrepreneurs is that there is a network group for these women, the formal women business networks (FWBNs) [2]. This group is already improving the current situation of women and ICT in Africa, but there are still a lot of steps that need to be taken to improve the women's situation and efficiency according to ICT. Ajumbi and Kyobe state in their conceptual model at proposition two the following: "The higher the ICT usage in a FWBN, the greater the contribution and personal benefits" [2].

#### 3.2 Opportunities

The biggest opportunities are in the indicated needs by the different researchers. These needs could be used to improve the current situation of the women in rural Africa. Wafula-Kwake and Ocholla indicated that women in Kenya and South-Africa are having difficulties with the use of ICTs [13]. Training could help them with this problem. Opportunities are within educating women in the rural countries to be ICT teachers themselves. It is important that women would be trained and helped within the fields they need the hardest: health for them and children, women's rights, and business information [13]. These fields will provide multiple opportunities for women to improve on.

Dlodlo also stated that there are big opportunities in the field of health [8]. They state that women are not aware of many national organizations that are there to help them, because they simply are not reached. They stay at home and are dependent on men. ICT could help with this problem to get the women more connected [8]. Kwake, Ocholla, and Adigun state the needs of the women in rural Africa [1]. Their needs are in the field of education, health, agriculture, business development and governance [1]. These needs are a big opportunity for ICT usage of women in rural Africa, because women could be helped within these sectors with ICT solutions and education. The radio and mobile phone are highly rated by the women in the study by Adigun, et al [1]. These kinds of ICTs could be useful for further education on the different needs, because they are seen as important.

Coleman also builds his article on the need for information about health [7]. He is focusing on the dangers of pregnancies. He stated that there is a low awareness about these dangers by the pregnant women in rural Africa. His results were used to set up a framework called the Pregnancy Danger Signs Mobile Architecture Framework (PDSMAF) [7]. This is an example of an ICT solution that could be used to improve the knowledge and live situation of the pregnant women in Africa. But he also stated that training is an important aspect for example the previous stated training through the radio [7]. These kinds of applications are good ICT solutions to help the women, but it is important that the users know how to work with the ICT devices, in this case the mobile phone, to ensure that the applications are used and can make a difference.

An example of opportunities for training is stated by Niebla. Niebla stated that women are learning to make blogs on the internet [12]. They are using these blogs to spread their knowledge about these fields where is an information need for [12]. These blogs are an opportunity for the ICT training and education.

These training needs information and Buskens and Webb state that it would be easier to develop education; because of this ICT area it is easier to access books and other learning material [5]. It is not needed to have a local bookstore of library to gain information anymore.

Buskens and Webb state that there is an opportunity on improving on individual level as well on social level when usage of ICTs will be trained and understand [4]. Women can employ themselves, but it will also be easier to connect with other parties and individuals. There is a need for women to connect with their family and other contacts.

### 3.3 Challenges

Wafula-Kwake and Ocholla stated that there are problems with the unavailability, inaccessibility, and also problems with infrastructure [13]. They also state that there is a big problem with literacy [13]. Bon, Akkermans and Gordijn also stated that these aspects that characterize rural Africa are the reason that ICT development is a challenge for implementing ICT projects [3]. Education would be difficult to be given without trying to improve on these problems too. These problems are also stated by Dlodlo and by Kwake, Ocholla, and Adigun, and Ho, et al. [1, 8, 9].

Infrastructure is focusing on the supporting facilitations where the ICTs are relying on [10]. Kwake, Ocholla and Adigun stated that costs, access and maintenance of the ICTs are important even if there is an infrastructure [1]. Otherwise problems will arise. Dlodlo says that the levels of literacy could be a problem, because this means that there need to be developed ICT training in the local languages [8].

Another challenge is stated by Dlodlo. He indicated that women and girls their attitude towards ICT could be a problem for development, because they see ICT as a difficult subject [8]. Everything that is seen as difficult is excluded, because of their self-image [8]. This is also stated by Buskens and Webb [4, 5]. They say that it is important that women grow their image about themselves. They are responsible for the family, but it is also important that they develop a self-esteem that they are more than a mother and servant of their men. Buskens and Webb state that this family role is educated to the girl's early on [5]. This means that they are clustered at house and cannot travel often. Niebla also states that it is necessary that women understand their political, social and economic reality [12]. It is important that their self-esteem in the offline world firstly improves, so their view on their need in the online world can also be worked on and improved. This could be a challenge for ICT training, because it is important to create a gender equal area to have a sustainable ICT development.

## 4 DISCUSSION

The purpose of this review was to get an overview of the current literature available about ICT education for women in Africa. This is done with a systematic literature review of all the articles available on Google Scholar provided with the following search query: *allintitle: Africa ICT women*.

The results provided a need for ICT to improve the information access for women on different fields. They need education, especially about how to use and maintain different ICTs. But there are different challenges which could be limitations to the opportunities for women and their ICT usage in rural Africa.

This research focusses on the continent Africa as one thing. However, it could be possible that there are big differences in needs between all the different countries in this continent. The current state on the field of ICT education and the knowledge of ICT already obtained by women could also be of a big difference between these different countries. This could be a limitation of this research.

Further research could focus on this limitation to ensure the differences between the different countries in Africa.

Other further research could focus on developing a framework on how to really improve on the current ICT situation for women in

rural Africa. This framework should focus on getting the needs of the women and taking into account the possible limitations to ensure that the framework could be a success.

## 5 CONCLUSION

This review provides an overview of the current research of women in Africa and their ICT usage. The search query was broad, but there were not that many results provided by this search query. Many of the usable literature were focusing on a conducted field study with interviews. This gives an overview on the current situation focusing on what the women already know about ICT, where they want to improve on, and their general thoughts about ICT usage for themselves. This is an important aspect to focus on, because Bon, Akkermans and Gordijn stated that there is a high failure of ICT projects because of mismatch between deployed technologies and local needs and contexts [3]. These researchers are great for getting an overview on the current situation, but the recommendations focusing on ICT education for women could be more detailed. It is logical that the women their self-esteem needs to be improved for themselves to see the meaning of ICT for their individual and social employment, but how could they do that? And how would this be possible in a sustainable way, because we are talking about rural areas. This means that accessibility and availability are important. Especially on financial fields, because the education budget is extremely different in comparison with projects in Europe for example. There are articles available that are focusing on ICT development for rural areas, for example the article of Bon, Akkermans and Gordijn [3], but there should be more recommendations especially focusing on women. This is important because these women have another background than the men and it is also important to develop smart and creative ICT solutions to make the projects work to overcome the current challenges and to build on the opportunities highlighted by the women themselves in rural Africa.

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## A APPENDIX A

Year	Author	Title	IC1	IC2	IC3	IC4	IC5	EC1	EC2
2009	Dlodlo	Access to ICT education for girls and women in rural South Africa. A case study	x	x		x	x		
2014	Buskens, Webb	Women and ICT in Africa and the Middle East: Changing selves, changing societies	x	x	x	x	x		
2007	Wafula-Kwake, Ocholla	The feasibility of ICT diffusion amongst African rural women: a case study of South Africa and Kenya	x	x		x	x		
2006	Adigun, Kwake, Ocholla	The feasibility of ICT diffusion and use amongst rural women in South Africa	x	x					
1999	Kole	An integrated approach to human resource development in ICT to support women in Africa						x	
2014	Coleman	The use of ICT tools (mobile phones) to improve awareness of pregnancy danger signs among pregnant women in rural communities of South Africa	x				x		
2014	Sow	Women and ICT in Africa: A new digital gap						x	
2014	Webb, Buskens	Women and ICT in Africa and the Middle East: Changing selves, changing societies							
2016	Ajumobi, Kyobe	Towards a theoretical model to investigate ICT-supported formal women business networks in sub-Saharan Africa			x				
2017	Smith, Turpin	Design science research and activity theory in ICT4D: Developing a Socially relevant ICT platform for Elderly women in Remote Rural South Africa						x	
2006	Smith	Tina and Ronel (2006) Women in the Information and Communication Technology sector in South Africa							
2014	Sow	Women and ICT in Africa: A New Digital Gap							
2015	Addo	Book Review: Women and ICT in Africa and the Middle East: Changing Selves, Changing Societies							x
2014	Selves	Women and ICT in Africa and the Middle East							x
2015	Addo	Women and ICT in Africa and the Middle East: Changing Selves, Changing Societies							x
2006	Alice	The feasibility of ICT diffusion and use amongst rural women in South Africa							
2012	Burkens, Webb	Changing selves, changing societies: women, gender and ICT in Africa and the Middle East	x	x					
2015	Colleau	Book review: women and ICT in Africa and the Middle East: changing selves, changing societies by Ineke Buskens and Anne Webb							x
2017	Ajumobi	Exploring ICT-supported Formal Women Business Networks (eFWBNs) the case of Kenya and South Africa							
2007	Wafula-Kwake, Ocholla	The feasibility of ICT diffusion among rural African women: A case study of South Africa and Kenya							
2019	Mbewe	Celebrating inspiring, passionate and dedicated WOMEN IN ICT: Assembled at the Namibia University of Science and Technology (NUST), the impactful Namibia Women in Computing Conference (NWIC) 2018 was an inspiring communion of women brought together by their love of technology and its advancements in Africa.						x	
2005	Kwake, Ocholla	Is ICT diffusion and use amongst rural women in South Africa feasible?						x	
2006	James, Smith, Roodt, Primo, Beeby, Fok	Women in the information and communication technology (ICT) sector in South Africa						x	
2008	Nkosi	ICT and the development of entrepreneurial skills of women in South Africa						x	
2015	Moutloutsi, Primo, Smith, Roodt, Evans	Women in the information and communication technology (ICT) sector in South Africa						x	
2015	Hafkin	Women and ICT in Africa and the Middle East: Changing Selves, Changing Societies						x	
2016	Niebla	Africa online: mujeres, TIC y activismo/Africa online: women, ICT and activism	x	x	x	x	x		
2015	Almenara Niebla	Recensión de: Buskens, Ineke y Webb, Anne (eds.) Women and ICT in Africa and the Middle East. Changing selves, changing societies, Londres: Zed Books ...							x
2015	Niebla	Recensión de: Buskens, Ineke y Webb, Anne (eds.) Women and ICT in Africa and the Middle East. Changing selves, changing societies, Londres: Zed ...							x