Research article

The status of teachers' collaboration in Ethiopian public universities found in the Amhara region

Samuel Zinabu Desta [a],[*], Seyoum Tilahun Gedefaw [a], Dessalegn Ejigu Tefera [b], Samuel Getnet Abate [a], Kindu Ayechew Ayenalem [b]

[a] Department of Lifelong Learning and Community Development, College of Education, University of Gondar, Ethiopia
[b] Department of Educational Planning and Management, College of Education, University of Gondar, Ethiopia

ARTICLE INFO

ABSTRACT

Research findings on the issue of teachers' collaboration in Ethiopian higher education institutions are limited. The main objective of this study was to examine the status of teachers' collaboration in Ethiopian public universities found in the Amhara region. In addition, this study also aimed at comparing the status of teachers' collaboration among the four generations of Ethiopian public universities found in the Amhara Region. Using a convergent parallel mixed design, data were collected from teachers, department heads, and academic deans through questionnaires and interviews using a multistage stratified sampling procedure. Four universities were selected from the ten public universities after stratifying them into four categories based on generations. From the sampled universities, 250 participants were selected randomly to complete a self-administered questionnaire. In addition, 8 teachers, 4 department heads, and 4 academic deans were selected using the purposive sampling technique for the interview. The quantitative data collected through a close-ended questionnaire were analyzed using mean, standard deviation, t-test, and one-way ANOVA, and the qualitative data were analyzed using thematic analysis. Finally, the qualitative and quantitative results were blended to compare or relate to each other. The findings of this study revealed that university teachers found in the Amhara region were moderately collaborative in information sharing and informal collaborations/collegial relationships. However, teachers' collaboration in professional activities seems unsatisfactory. The result of this research also indicated that there is a significant difference across the four generations of universities. Hence, Ethiopian public universities found in the Amhara region should give adequate attention to strengthening collaboration among teachers in professional activities.

1. Introduction

Collaboration is a term we hear and use often in various issues and contexts [1]. [2] defined teachers' collaboration as "two or more teachers who work interdependently to share knowledge and skills, information, and resources to achieve a common goal" (p. 54).

Collaboration has received increased attention in a variety of disciplines, including education and sociology [3]. [2] noted that collaboration among teachers is considered a meaningful part of their work. Several studies have found that improved teacher collaboration benefits both students' achievement and the teaching profession. Collaboration helps teachers to share ideas, share

---

* Corresponding author.
  E-mail addresses: samineby19@gmail.com, samuel.zinabu@uog.edu.et (S.Z. Desta).

responsibilities, and discuss common interests (Pearson, 1999, cited in Ref. [4], thereby allowing them to create associations for their collective rights, benefits, and responsibilities. Collaborative schools develop collegiality and shared decision-making among their staff members [5].

Teachers may collaborate for many reasons, including student accomplishment [6,7], feeling less personally isolated [8], and professional development [9].

[10] noted that teachers' collaboration is vital to avoid old practices and to generate new useful ideas and practices. Unless collaboration is happen among teachers, positive change in the works of the teachers will never exist. Moreover, they stated that in recent years, researchers have given their attention to professional collaboration and professional collaboration of teachers that lead to greater student achievement and that there is a link between professional collaboration and teachers' effectiveness. Furthermore, collaboration is viewed as a strategy for the professional development of teachers [5]; Reezigt et al., 1996, cited in Ref. [11].

Most of the time, the collaboration of teachers at higher education institutions starts at the individual teacher level and becomes an organizational collaboration through the teachers' affiliation. It is not expected that all collaboration efforts are equally effective, and the effectiveness of professional collaboration lies on a continuum ranging from weak to strong collaboration [5].

A true collaboration is a voluntary and equal basis collaboration of working together to assure mutual benefit among the teachers [12]. noted that a collaboration established in a hierarchical approach would even weaken the teacher's previous collaboration, and they may be further disgusted with other professional development programs [10]. stressed how professional collaboration should be effective and pointed out possible strategies designed to make professional collaboration more deliberate and effective, including data teams, professional learning communities, critical friend circles, and learning walks. These strategies may be context-dependent and vary from school to school. The effectiveness of collaboration is largely dependent on ensuring mutual benefit, respect, and trust among members. However, the two parties may have different concerns and interests, and ensuring their benefit takes somehow long period. Successful collaboration requires the participants themselves to perceive the community as a shared investment. Here, both parties interests should be based on their mutual benefit.

[5,11] advocate that departments will serve as the center of collaboration, but most research focuses on the school organizations, and little is known about how the specific departments work. "Teachers are naturally connected by the subject they teach." [5]; Reezigt et al., 1996; [11]; P.1).

[13] examined the iterative and interactive nature of collaboration. Teachers sometimes accept new ways of doing and reverted to the old practice and again tried the new one [13]. asserted that building collaboration among teachers was slow; it took reasonable time like once a community is established that everyone trusts and respects each other, and working for the benefit of them requires much time.

Currently, the internet is an essential platform for creating collaboration among teachers everywhere. Through electronic methods and the internet, teachers can even collaborate at different levels, such as from school to school, or country to country. Email and the internet enable teachers to share teaching materials, research findings, laboratory results, experiments, experiences, etc. [4]. Hence, the teacher needs much support, such as time, good equipment, technical support, and websites, to strengthen their collaboration.

Some of the factors that influence teachers' and teachers' effectiveness are content knowledge, teacher collaboration, and teacher career satisfaction [14]. In the teaching profession, for example, team teaching can be considered an effective outcome of collaboration [14].

[7] stressed the need for frequency of collaboration among teachers, the more they frequently collaborate the more they become effective in instructional improvement and the reverse is true [7] stated that instructional leaders' roles are vivid in fostering collaboration among teachers and that they are catalysts of collaboration. Leaders' involvement in creating relationships and active engagement in instructional practice among teachers can bring improved outcomes for students (Robinson & colleagues, 2008, cited in Ref. [7]; p. 503) [7] confirmed that instructional leadership and teachers' collaboration have a direct relationship with improving their practice. It can be inferred here that the collaboration of teachers can highly influence students' outcomes, which in turn can be a determinant factor of quality education.

Studies confirmed that teaching in the United States has been an isolated work but in recent years there is a push to transform teachers into collaborative instructions [15]. Policymakers and experts give due emphasis to collaboration among teachers to improve students' achievement. However, in most of the studies, collaboration among teachers was viewed from the students' achievement perspectives, which overlooked the importance of collaboration among teachers for themselves, for the betterment of their profession as teachers, for the social significance and cohesiveness among themselves, and better organizational success and school improvement in all spheres. In most of the previous studies, collaboration is a school-level phenomenon by which schools are viewed as the limit of collaboration among teachers [15]. The previous studies do not even go beyond instructional collaboration; some other informal collaborations that strengthen the formal instructional collaboration that will serve even as a foundation for instructional collaboration seem to have been overlooked.

[15] examined teacher collaboration in instructional teams and student achievement by surveying over 9000 teachers and huge administrative data in the United States and confirmed that there were different kinds and qualities of collaboration and the average collaboration quality has a causal relationship with the student's achievement and concluded that naturally occurring collaboration is helpful to enhance students' achievement.

As stated above, most of the previous studies emphasized the contributions of teachers' collaboration on students' academic achievement at primary and secondary education levels. The collaboration of higher education teachers' seems overlooked. Therefore, the main objective of this study was to examine the status of teachers' collaboration in Ethiopian public universities found in the Amhara region. In addition, this study also aimed at comparing the status of teachers' collaboration among the four generations of Ethiopian public universities found in the Amhara Region. The following research questions were formulated to achieve the objectives

of the study.

1. To what extent do teachers collaborate in information sharing?
2. To what extent do teachers collaborate in professional activities?
3. To what extent do teachers collaborate in social relationships?

2. Conceptual framework

Fishbough (1997) cited in Ref. [4] propose three models on which the teachers base their theoretical base of collaboration including consulting, coaching, and teaming in his study conducted at the primary school level. The consulting model of collaboration takes place when the expert advises those who have less knowledge, and communication is dominated by one way in which the consultee is the receiver and the consultant is the sender. In the coaching model, the participants assist each other so that the coach and the person being coached can dialogue about their strengths and weaknesses. In the team model, participants consider themselves interactive team members and take ownership of responsibility and decision-making in their collaborative effort.

The study aimed at testing the fishboughs model of collaboration. The study also assumed that individualism/isolation occurs in the three models. Most of the school's teachers rarely use the internet for collaboration purposes, only a few of them share ideas, join professional lists, give information, and find teaching material. Most of the science teachers had a negative idea about collaboration using the internet as there were many barriers to their collaboration, such as time, which is the main problem for them, and equipment.

As suggested by scholars, there are different forms of collaboration among teachers [5]. distinguished four forms of teachers' collaboration, including storytelling and scanning for ideas, sharing, making agreements, and aid and assistance. Later [11], added joint work as the fifth component of collaboration.

Storytelling refers to teachers talking with each other. Teachers may share experiences when they are talking to each other and they experience similar problems among teachers. Sharing as a form of collaboration usually includes sharing teaching materials. Teachers may exchange materials through mail and hardcopy. Sharing would depend on what kind of material the teacher received and what they did with it. Agreeing to a form of collaboration refers to the teachers' agreement on different issues, for example, which chapter should be covered, how they can test the students, the method of teaching they employ, etc. Some of the teachers' activities may be restricted by their agreements. Teachers may collaborate in aid and assistance, as a form of collaboration. Teachers may help each other by giving and receiving advice. Junior teachers may be influenced by their senior teachers' help. In joint work, teachers may collaborate to work together to achieve a certain defined goal. For example, they may be engaged in coaching, visiting each other's classes, and giving and receiving feedback. This form of collaboration is often referred to as "peer coaching" (Showers & Joyce, 1996, in Ref. [11]; p. 2).

As [7] note, if collaboration is rarely supported by formal structures, the implementation would be random; it would occur at some places like hotels, cafés, and some other places, and finally, it would not occur at a specific point in time. Collaboration can be formal, organized, and supported by the formal structure of the educational organization or in an informal way.

Informal collaboration is an initial point that grows into formal collaboration. Informal collaboration usually brings about and fosters formal collaborations among teachers. However, formal collaboration may happen without informal settings using the formal structure of the school.

[11] in his finding confirmed that there was a difference between teachers in formal and informal collaborations. The formal collaboration includes topics that are not directly related to teaching, such as scheduling and buying course materials. Informal collaboration is concerned with topics related to teaching.

As mentioned above, all forms of collaboration among teachers can be broadly classified as informal collaborations, information sharing, and formal collaborations. Teachers may exchange information in either informal or formal collaborations. Moreover, Ethiopian higher education teachers have mainly three main activities, including teaching, research, and community engagement/ service. Collaboration in these main activities can be seen as collaboration in professional activities. The collaboration of higher education teachers may not be limited to professional activities. Higher education teachers will have informal collaborations like social or collegial relationships in or outside of the work environment. Furthermore, higher education teachers may be sharing among themselves—they may share information either in professional activities or in their other informal relationships. In general, in this study, collaboration in higher education is seen in three forms, including information sharing, professional activities, and informal/collegial relationships.

3. Methods

This study is a part of a research project on "teachers'" experiences of collaboration and isolation and its implications for quality education, which was undertaken in Ethiopian public universities found in the Amhara Region.

3.1. Research design

This study followed a mixed-methods research approach, which the authors believe is important in terms of increasing the validity of results as it enables one to gain a deeper and broader understanding of the problem than studies that do not utilize both quantitative and qualitative approaches [16]. Specifically, a convergent parallel mixed method design that involves collecting qualitative and quantitative data was used. It enabled the researchers to provide both a condensed understanding of the problem as well as details of

the issue to be studied [16,17] and make results more reliable by triangulating the quantitative and qualitative types of data [18].

3.2. Data sources and sampling

The study used primary data sources such as teachers, department heads, and deans. The participants were selected using a multistage stratified sampling procedure. In the first stage, four universities were selected from the total of ten public universities that are found in Amhara National Region State after stratifying them into four categories based on generations. Accordingly, Bahir Dar, Wollo, Debre Tabor, and Debark universities were randomly selected from first-, second-, third-, and fourth-generation universities, respectively. Then, in the second stage, a proportional number of participants were selected from each university, considering the number of active academic staff at each university. In total, 250 participants were selected randomly to complete a self-administered questionnaire. In addition, two teachers, one department head, and one academic dean from each sampled university were purposively selected for the interview.

3.3. Data collection instruments

We used a questionnaire and an interview as data collection instruments. The questionnaire was developed, consisting of 10 close-ended items and some open-ended items, to collect data from 250 teachers. A scale relying on self-reporting by the teachers was used. The participants indicated their responses, on a five-point Likert scale ranging from 1 (very low) to 5 (very high). The mean score for each item was computed, and the high scores indicate a high level of collaboration among the teachers. As the questionnaire is self-developed, to ensure its quality, reliability, and validity, six fundamental stages were followed, including (1) identifying the first thoughts of the items from the literature, (2) formulation of the first draft of the questionnaire, (3) face validity of the questionnaire, (4) pre-testing of the questionnaire, (5) piloting of the questionnaire, and (6) adoption of the questionnaire. Cronbach's coefficient alpha was computed to ensure the reliability of the items, and the result assured that the questionnaire items were reliable (Cα = 0.853). From the 250 distributed questionnaires, 203 (81.2%) were completed and used for analysis. The second instrument was a semi-structured interview to collect data from eight participants, including eight teachers, four department heads, and four academic deans. Interview schedules and interview protocols were prepared in advance [17], and then translated into Amharic (the participants' native language). The interviews were conducted face-to-face in the interviewees' offices, and both note-taking and audio recording was undertaken. All interviews took an average of 50 min and were audio-recorded with the permission of the participants. The validity of the interviews was ensured through expert and peer validation. The data obtained from the questionnaires and interviews were collected simultaneously.

3.4. Data analysis techniques

The quantitative data were analyzed using mean, standard deviation, independent *t*-test, and one-way ANOVA through IBM SPSS version 20, whereas a reflexive thematic analysis approach was applied to analyze the qualitative data. The procedure follows six steps: 1) familiarizing with the data, 2) coding, 3) generating initial themes, 4) reviewing themes, 5) developing themes, and 6) writing up [19,20].

3.5. Ethical considerations

The college review and ethical committee (CREC) at the University of Gondar approved this study in 2020. The participants were informed of the purpose of the study and could voluntarily decide whether to take part in it and informed consent was taken from all of the participants of this study. Throughout the data analysis, we used codes for participants' direct quotes (Teach 1, 2, 3 … for teachers, Head 1 2, 3 … for department heads, and Dean 1, 2, 3 … for academic deans).

4. Findings

In this section, we tried to present the findings regarding the general status of Ethiopian public university teachers' collaboration The findings regarding the status of teachers' collaboration in information sharing, professional activities, and informal relationships are stated. Moreover, the findings focusing on the comparison of the status of collaboration among teachers in the four-generation universities are presented.

4.1. The extent of collaboration among teachers

The interview results of this study revealed that the extent of collaboration seems unsatisfactory in most of the Ethiopian public universities found in the Amhara region.

> At the university level in general and in our college in particular, the culture of collaboration is weak. At the university, college, and department levels, there are no platforms and frameworks that encourage collaborative work and learning, especially in the teaching-learning process. [Head3]

> In my college, the culture of collaboration is said to be weak, but this does not mean that collaborative activities are absent … To some extent, a few teachers attempted to collaborate among themselves, but not broadly and widely. The culture of collaboration is weak in our college, especially the culture of learning through collaboration. [Teach6]

Some teachers reported that collaboration among teachers was not driven by the personal motives of teachers, but rather by officials' impositions. For instance, Teach 8 reported that:

> … teachers do not collaborate based on personal motivation. However, for example, teachers often collaborate when the department or college gives them a task to do collaboratively. Otherwise, teachers do not show a willingness to collaborate on those tasks unless told to do so by the department or college. [Teach8]

As it was revealed in the interview results, when we compare collaboration among teachers across academic units, it was reported that there was better collaboration at lower academic unit levels such as department, unit, and college; there was better collaboration at the department level than at the college/faculty level. Collaboration among teachers decreases when we go from one department to the next in the hierarchy of the university. Most of the interviewees reported that their respective departments have better collaboration among teachers than their equivalent departments within the university. It was also reported that there were departments and colleges within the university that served as role models in collaboration, compared with their equivalents. As is revealed from the interview result, department heads and instructional leaders influence the collaboration of teachers.

> The teachers' collaboration is a very important tool. Without the teachers' collaboration as researchers and teachers could not be succeeding. This concept needs the mobilization of the university community. However, to be honest the teachers' collaboration at a university is not at the expected level. [Teach1]

> At the college level, teachers' collaboration is not at the expected level. However, at the department level, the collaboration between teachers is better. Even other teachers mention our department as a model of teachers collaboration. In the meeting, the feedback for our department is good. The former department head was one of the members who encourage the teachers to work collaboratively. Collaboration between departments at the college level did not yet exist. There were some attempts at collaboration between departments in research but fail to achieve their objectives because of the absence of good collaboration. [Teach2]

> … fortunately, in our college and department, I can say that we have a strong collaboration both in the workplace and in social life. Our college and department teachers have the willingness and commitment to work on everything cooperatively ….When I come to specifics, our department teachers have very strong collaboration in almost every task of the department. Before going to implement any task (be it related to teaching-learning, research, publication, and community service), we have a culture of discussion on the issues together either formally or informally … [Head1]

> There is a good collaboration among teachers in our department. However, there is no collaboration of teachers among other teachers in other departments. [Head2]

> Our department is new to this university. The extent of collaboration among teachers is high in our department compared with other departments …. [Teach4]

As stated above, we have presented the general status of collaboration among Ethiopian public university teachers found in the Amhara Region. The extent of collaboration among teachers in Amhara region universities is examined in this study through three main themes: collaboration among teachers in professional activities, collaboration among teachers in information sharing, and collaboration among teachers in informal collaborations or collegial relationships.

Teachers were asked to rate their level of agreement in the survey as strongly disagree (1), disagree (2), neutral or undecided (3), agree (4), and strongly disagree (5). Hence, the mean of three is understood as undecided/neutral. As shown below in Table 1, the

Table 1
Collaboration of teachers in information sharing and professional activities.

Items	N = 203	Mean	SD
A. Collaboration in information sharing			
1. Exchange of teaching materials		3.67	1.079
2. Discussion on teaching materials		3.20	1.163
3. Discussion on the improvement of students		3.16	1.087
4. Attendance at team conferences		3.08	1.081
5. Information sharing about curricula		3.24	1.082
Average sub-scale		**3.27**	**1.098**
B. Collaboration in professional development activities			
6. Team teaching		2.56	1.174
7. Observing other teachers in the classes and providing feedback		2.19	1.196
8. Coordinating jointly the students' activities		2.75	1.112
9. Doing research together		3.27	1.135
10. Developing community service projects/activities together		3.27	1.168
Average sub-scale		**2.81**	**0.846**
Aggregate mean		**2.76**	

mean score of collaboration of teachers ranges from the lower level (M = 2.19, SD = 1.196) to a relatively high level (M = 3.67, = 3.67; SD = 1.079).

As depicted in Table 1, the aggregate mean (2.76) showed that there is a low level of collaboration among teachers in their respective universities.

4.1.1. Collaboration among teachers in professional activities

As depicted in Table 1, nearly the majority of the teachers are not engaged in team teaching (M = 2.56 and SD = 1.174). Most of the teachers did not observe each other in the classroom, and they did not provide feedback among themselves (M = 2.19; SD = 1.196). Most teachers were not also engaged in coordinating students' activities jointly (M = 2.75, SD = 1.112).

The qualitative data also confirmed that there was minimal collaboration among teachers in the teaching-learning process.

> I rarely see where teachers discuss improvements in teaching materials. Teachers only focus on the course or courses that they are assigned to teach. There is no collaboration in the teaching process. [Teach7]

> … but it is difficult to say teachers are collaborating in the teaching and learning activities. It is mainly because of the absence of a culture of collaboration in higher education institutions. We have had or are aware of collaborative experiences in schools that were best practices. However, when we come to higher education institutions, it is discouraging. There is no culture of observing colleagues' classroom practices; debating, giving strong, constructive criticism, coming up with ideas to solve problems, and the like are not seen in higher education institutions. [Dean4]

> The level of teachers' collaboration in the teaching-learning process is low. [Head3]

Some universities reported that there was a collaboration among teachers during the examination, which will be considered as one part of the teaching-learning process.

> Other … exam … During the exam, there are no teachers who are not willing to work collaboratively, whether they have a course or not. The exams were done without any limitations in collaboration. [Dean1]

> Similarly, in the teaching-learning process, they prepare exams in groups. For example, in exam preparation, a teacher may be assigned to prepare an exam, another instructor may edit it and another may duplicate the exam, or different teachers may prepare exams for a course by dividing different parts of the exam, and the course coordinator may merge the different parts of the exam that are prepared by individual instructors. [Dean2]

Regarding team teaching, dean1 explained that:

> Yaw …..more … We emphasize specialization in the provisions of the courses. When we cannot teach, we invite teachers from other universities. Sometimes, the features of some courses may have two or three parts; for example, one part of the course may be covered by one specialization and the other by another specialization. During this time, two teachers work in collaboration to provide the course … Yeah, there was a time when we gave one course to two teachers. For example, I taught the horticulture part, and the other taught the agronomy part. [Dean1]

As shown in Table 1, the relative majority of teachers responded that there was a relatively good collaboration among teachers in conducting research and in the provision of community service.

Similarly, the qualitative findings showed that in most of the universities, there was a greater collaboration of teachers in research and community services compared with teaching and learning, although not as expected. In some universities, collaboration among teachers was influenced by official guidelines. However, teachers would like to do research and publish alone/individually since the weight of accreditation for individual work is better than group work.

> There is a rule in research that requires one principal investigator and two co-researchers to work in a group. Conducting research individually is not allowed. Even though they form research groups under the influence of the rule, they still need to work individually. If individual teachers conduct research alone and publish their work individually, they get many benefits from it. [Teach3]

> Right! As I told you earlier, the collaborations practiced by teachers are usually direction-based. For example, based on the university's directives, it is not possible to receive funds for individual research and community service projects. This directive makes teachers collaborate. Let me add one more directive-based teacher collaboration. Due to the COVID-19 pandemic, we formed a committee and gave psychosocial support to students and the community. [Teach8]

> In our college, relatively, teachers collaborate better in mega-research and community service projects related to other activities. [Head3]

> Concerning research and community service, our teachers are working in collaboration … They have been working on activities involving two or more teachers … by presenting literature and proposals … until now. This is also an indicator of to what extent teachers are working in collaboration. (Dean1)

> … but in our college, there are some instances of collaboration among teachers in doing mega-research and providing community services in course sharing, especially in the postgraduate program. [Dean3]

This study's findings also revealed that teams were formed at some universities to conduct research and community service. Regarding this, Head1 replied that *"About research and community service engagements, we establish sub-teams in each specialization and mix them for the actual work."* [Head1].

In some universities, a collaboration of teachers in conducting research seems unsatisfactory and limited to certain individuals. *"… at the individual level, there are few teachers who collaborate in mega research and community service projects, in winning* grants *and publication works."* [Head3].

The result of this study revealed that there was better collaboration among teachers in conducting research and providing community service than in the teaching-learning process. *"… there is no collaboration in the teaching process. Somehow teachers are collaborating on research work."* [Teach7].

4.1.2. Collaboration of teachers in information sharing

Table 1 shows that the relative majority of teachers were cooperative in terms of information sharing and material exchange. The majority of teachers collaborated in the exchange of teaching materials and discussion of teaching materials. Teachers were discussing how they could improve the student's academic performance. Therefore, the findings of this study confirmed that university teachers were relatively good at collaborative information sharing.

4.1.3. Collaboration among teachers in informal collaboration/social relationship

The result of this study revealed that in most of the universities, there was a better collaboration of teachers in informal collaboration/social relationships.

> … college teachers have better relationships when it comes to social issues. They learn about the good or bad situations of the teachers by visiting their homes. We have a social committee at the college level; this may be a good opportunity for teachers to work collaboratively. [Teach2]

> There are nine instructors in the department. All of the instructors in this department are young. We have a strong social relationship … Collegial relationships among teachers in our department are good. We eat, walk, and work together. The department members are known to have close friendships at the university. To work on different tasks effectively in a team, first, the team members should have good friendly relations. [Teach4]

> I feel that the social relationship is very good. For example, teachers are good at drinking tea together and spending time together in times of 'desta' and 'hazen'. I would be very happy if teachers were also good at working together in terms of the social aspects. [Teach8]

> People in institutions form friendships in different ways. I believe that the collegial relationship between teachers in our department and the college is good. Its indicators are as follows: 1) There is no longer any "disagreement" in issues. 2) Teachers share courses appropriately without competition. 3) There are attempts to cover courses for their colleagues when they are unavailable. [Head4]

As we understood from the above excerpts, there were better teachers' collegial relationships at the department level compared with at the college and university levels. The main factor in the teachers' collaboration here is the specialization they have.

As shown in the findings of this study, the social or collegial relationship was unsatisfactory in some universities.

> Teachers have interests that cannot be shared by other teachers. Many of the teachers outside the department work in isolation without collaboration with their colleagues. In some departments, the teachers do not know each other; there is role conflict and duplication in applying the research proposals. Our university's teachers, except for some departments such as X, do not have a good collaboration and collegial relationships. [Teach1]

Some teachers reported that the collegial relationship among the teachers was influenced by each teacher's personality.

> It depends on the teacher's personality. This form of relationship is dominant in our department. Teachers have relationships outside of university activities. They do have social interactions outside of campus. They help each other in both good and bad times for the department's members. [Teach1]

As shown in the result of this study, some participants explained that collegial relationships are relatively high at the department level and low across departments and colleges, collegial relationships seem confined at the department level.

> In our department, teachers are working together closely. There is a good relationship. Since the faculty is wide, there is no collegial relationship among different department teachers. Teachers may not even know each other at times. [Head2]

> Nowadays, it is difficult to say there is friendship in the workplace. It could be because of leaving inflations. Even minor materialistic benefits conflict with teachers. Due to this, I cannot say some staff members walk together, eat together, discuss social and academic issues together, and work together. Even when some of us meet together, we talk about different social issues, not academic issues; I do not know what you are talking about while meeting together. [Dean4]

4.2. Collaboration of teachers across universities

As shown in Table 2, there is a statistically significant difference in the level of collaboration of teachers among universities. The comparison among universities is presented in detail in Table 3 (LSD multiple comparisons).

As shown in Table 3, the ANOVA result of teachers' collaboration among universities shows that there is no statistically significant difference (0.092) between Bahir Dar University teachers' collaboration with Wollo University. The teachers' collaboration at Bahir Dar University is statistically significant compared to that at Debark and Debre Tabor Universities. The mean score of Wollo University teachers' collaboration with Debark University is not statistically significant, but it is statistically significant with Debre Tabor University teachers' collaboration. There is a statistically significant difference between the mean score of Debre Tabor University teachers' collaboration and Debark University teachers' collaboration.

As revealed in the qualitative result, the extent of collaboration among teachers varies across the generations of the universities. Collaboration among teachers in first-generation universities seems to be low compared with that in second, third, and fourth-generation universities, and vice versa. In first-generation universities,[1] the level of collaboration among teachers decreased from time to time, and the culture of collaboration and mutual learning among teachers deteriorated over time. However, the collaboration of teachers in the fourth-generation universities was found to be relatively good compared with the first-generation universities.

> I have ten years of teaching experience, so I can evaluate the current status of teachers' collaboration in our college and my department. Formerly, before five years ago, there were some instances of collaboration among teachers in our college, especially in the areas of mega-research and community service projects, but at this time, these kinds of collaboration are weak because, currently, the culture of our university and college is more about competition and personal enrichment than doing together for the common good. In our college, we researched the title "workplace learning," and the main finding of this research is that the internet is the predominant source of knowledge for teachers, and collaboration is almost absent in our university in general and in our college in particular. We can conclude that the extent of teachers' collaboration in our respective colleges and departments is very low. [Teach5]

> I have been working for more than 10 years at this university. Our university's collaborative working culture among teachers is dwindling. In comparison to my current experiences, collaboration among teachers was good when I was a new teacher at this university. I don't understand why … (Dean 4)

4.3. Comparison of teachers' collaboration in information sharing and professional activities

As depicted in Table 4, there is a statistically significant difference in the mean score across the forms of collaboration. There is a statistically significant mean difference in collaboration among teachers (0.000) in information sharing and professional activities. As shown in Table 4, the mean score of teacher collaboration in information sharing (3.27) is greater than the mean score of teacher collaboration in professional activities (2.81). Hence, teachers were more collaborative in information sharing compared with professional development activities.

5. Discussion

Several studies often promote the importance of teachers' collaboration, though it is less frequently investigated for its effect [21]. Teachers, according to Ref. [22]; must collaborate to improve their professional knowledge and experience, as well as student learning achievement. Collaboration among teachers significantly improves the performance of universities. The performance of collaboration in higher education institutions is predominantly affected by teachers' collaboration within the institution and across institutions.

As shown in the result of this study, the extent of collaboration among teachers in Ethiopian public universities found in the Amhara region seems unsatisfactory. Most universities did not create a platform to strengthen teachers' collaborative work environments. In congruence with these findings [21], stated that collaboration in universities receives minimal attention; it is neither supported by the officials nor provided as coursework.

This study's findings revealed that teachers were motivated to collaborate in informal ways on different social issues at the department level, although this was limited at the college level and across different academic units within the university. Teachers in the department were close because their professionalism and specialization worked well together [11]. asserted in his finding that simple forms of collaboration (like storytelling, scanning for ideas, and agreeing) were exercised more than complex forms of collaboration (aid and assistance, and joint work). Teachers are connected by their specialization and/or department [5]; Reezigt et al., 1996; [11].

The result of this study confirmed that the extent of collaboration among teachers varies across universities, colleges, and departments within the university. The extent of collaboration among senior university teachers has decreased as seniority has increased. A previous study by Ref. [7] confirmed that there were collaboration, collective efficacy, and instructional leadership differences

---

[1] The Ethiopian Ministry of Education categorized public universities into four categories based on their age of establishment, or seniority, 1st generation, 2nd generation, 3rd generation, and 4th generation universities. The 1st generation universities are more senior universities than the remaining and the same is true for 2nd, 3rd, and 4th generation universities.

Table 2

Collaboration of teachers across universities (One-way ANOVA test).

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	9.936	3	3.312	6.200	.000
Within Groups	101.489	190	.534		
Total	111.425	193			

Table 3

Collaboration of teachers across universities (LSD Multiple Comparisons).

(I) university	(J) university	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Bahir Dar University	Wollo University	−.25543	.15080	.092	−.5529	.0420
	Debre Tabor University	−.62500[a]	.14629	.000	−.9136	−.3364
	Debark University	−.33333[a]	.14919	.027	−.6276	−.0391
Wollo University	Debre Tabor University	−.36957[a]	.14793	.013	−.6614	−.0778
	Debark University	−.07790	.15080	.606	−.3754	.2196
Debre Tabor University	Bahir Dar University	.62500[a]	.14629	.000	.3364	.9136
	Wollo University	.36957[a]	.14793	.013	.0778	.6614
	Debark University	.29167[a]	.14629	.048	.0031	.5802
Debark University	Bahir Dar University	.33333[a]	.14919	.027	.0391	.6276
	Wollo University	.07790	.15080	.606	−.2196	.3754
	Debre Tabor University	−.29167[a]	.14629	.048	−.5802	−.0031

[a] The mean difference is significant at the 0.05 level.

Table 4

Collaboration of teachers across the forms of collaboration (Paired Samples Statistics).

		Mean	N	SD	95% Confidence Interval of the Difference		t	df	Sig.
					Lower	Upper			
Pair 1	Collaboration in information sharing	3.27	194	1.098	.33692	.54761	8.280	193	.000
	Collaboration in professional activities	2.81	194	0.846					

among schools. Therefore, this clearly shows the extent of collaboration varies across different settings/contexts.

[23] suggested there must be collaboration among teachers to develop innovative teaching methods that will satisfy the diverse demands and make all students succeed. However, the result of this study showed that teachers were less collaborative in the teaching-learning process [21]. confirmed that better student achievement was recorded because teachers collaborated on teaching-learning issues. They suggested that teachers should collaborate on different issues related to curriculum, instruction, and professional development. The finding of this study, however, revealed that higher education teachers' collaboration in teaching was not satisfactory, teachers taught students in isolation. Teachers taught their students based on the experiences of their memories of their studentship [21]. In this regard [11], confirmed that most of the collaborations emphasized subject matter followed by testing, and the least attention is given to teaching methods.

The finding of this study showed that higher education teachers were relatively good to provide community service and conducting research in collaboration. The fact that direct and indirect administrative impositions on teachers to do research and community service in collaboration was vivid. In this case, here, convincing teachers with the support of some binding directives that promote collaboration among teachers will be better to do research and community service than rigid impositions. However, collaboration seems more of a voluntary activity done by two or more persons with a team spirit but it has negative consequences on professional autonomy [22].

As it is indicated in this study, informal kinds of collaboration are practiced better than formal and professional activities collaborations. In line with this finding [11], in his study confirmed that informal collaboration is as satisfactory and worthwhile for teachers as formal collaboration. There was a perception of teachers viewing informal collaboration as a burden and giving less attention to formal collaboration. In addition, the ways teachers perceive the subject also determine the collaboration of teachers. Teachers are more likely to collaborate when they perceive the subject as evolving and changing in nature than they have a clearly defined and static view of the subject they are taught. The subject characteristics by themselves might not create the difference in collaboration rather the teachers' perception matters. In case, the individual teachers who taught the same subject might have different levels of collaboration and different perceptions about the subject characteristics. The way teachers perceived their autonomy, did not influence collaboration between teachers.

6. Conclusion

The findings of this study confirmed that public university teachers found in the Amhara region were moderately collaborative in information sharing and informal collaborations or collegial relationships. However, teachers' collaboration in professional development activities seems unsatisfactory. The ANOVA result showed there was a statistically significant difference in teachers' collaboration across universities. There was a better collaboration in the fourth- and third-generation universities than in the second and first-generation universities.

Considering the findings of this study, teachers' collaboration in Ethiopian public universities found in the Amhara region seems superficial; there is a moderate level of collaboration in information sharing and informal relationships. However, teachers' collaboration in professional activities that will enhance organizational performance, and the teaching-learning process, thereby improving students' academic success seems to be unsatisfactory.

Teacher collaboration has received little attention in Ethiopian public universities in the Amhara region. No platform has been established to strengthen the culture of teacher collaboration and mutual learning. Hence, there is a need for universities to create a platform (like awards and prize programs, celebrations, seminars, workshops, conferences, regular meetings, and refreshment programs) that will strengthen teachers' collaboration, particularly in professional activities at the university level. Teachers' and educational leaders' commitment is essential to creating a collaborative working environment. Moreover, the guidelines and directives of the universities should be revised to promote collaboration among teachers.

In this research, higher academic officials of Ethiopian public universities, including presidents and vice presidents, were not included as participants in the study. Most of the previous studies focused on studying the collaboration of teachers at the school level. However, research findings on the collaboration of higher education teachers seem overlooked. Therefore, future researchers will benefit if they research the impact of teachers' collaborations on students' academic achievements at higher education institutions. The researchers also recommended that the challenges of teachers' collaboration in higher education in Ethiopia be studied in the future.

Data availability

Data are available from the authors at a reasonable request.

Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Funding statement

Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.heliyon.2023.e12848.

References

[1] A. Irajpour, F. Ghaljaei, M. Alavi, Concept of collaboration from the islamic perspective: the view points for health providers, J. Relig. Health 54 (5) (2015) 1800–1809, https://doi.org/10.1007/s.

[2] B. Eschler, Finnish Teacher Collaboration: the Behaviors, Learning, and Formality of Teacher Collaboration (Doctoral Dissertation), Retrieved from All Theses and Dissertations, 2016, 6191.

[3] D. Muijs, M. Ainscow, C. Chapman, M. West, Collaboration and Networking in Education, Springer Science & Business Media, 2011.

[4] P. Suntisukwongchote, Testing models of collaboration among high school science teachers in an electronic environment, High Sch. J. 89 (3) (2006) 22–33.

[5] J. Little, The persistence of privacy: autonomy and initiative in teachers, Teach. Coll. Rec. 91 (4) (1990) 509–536.

[6] W. Spitzer, K. Wedding, LabNet: an intentional electronic community for professional development, Comput. Educ. 24 (3) (1995) 247–255.

[7] R. Goddard, Y. Goddard, E.S. Kim, R. Miller, S. American, N. August, A Theoretical and Empirical Analysis of the Roles of Instructional Leadership, Teacher Collaboration, and Collective Efficacy Beliefs in Support of Student Learning 121, 2015, pp. 501–530 (4).

[8] D. Drotar, Reflections on interdisciplinary collaboration in the new millennium: perspectives and challenges, J. Dev. Behav. Pediatr. 23 (3) (2002) 175–180.

[9] J.P. Barufaldi, J. Keinhartz, The Dynamics of Collaboration in a Statewide Professional Development Program for Science Teachers. Models of Science Teacher Preparation- Theory into Practice, Kluwer Academic Publishers, 2001.

[10] A. Hargreaves, M. O'Connor, Solidarity with solidity the case for collaborative professionalism, Phi Delta Kappan 100 (1) (2018) 20–24.

[11] L. Van Wessum, Collaboration and Teachers' Perception of Professionality in Schools for Secondary Education, 1999.

[12] A. Hargreaves, R. Dawe, Paths of professional development: contrived collegiality, collaborative culture, and the case of peer coaching, Teach. Teach. Educ. 6 (3) (1990) 227–241, https://doi.org/10.1016/0742-051x(90)90015-w.

[13] P.C. Blumenfeld, J.S. Krajcik, R.W. Marx, E. Soloway, Lessons Learned : How Collaboration Helped Middle-Grade Science Teachers Learn Instruction 94, 1994 (5).

[14] A. Narayan, Factors influencing teacher career satisfaction, teacher collaboration, and everyday challenges: an exploratory factor analysis, Malays. Online J. Educ. Sci. 4 (3) (2016) 24–38.

[15] M.R. Ronfeldt, F. Kiel, J.A. Grissom, Teacher collaboration in instructional teams and student achievement, Am. Educ. Res. J. 52 (3) (2015) 475–514. Retrieved from, tinyurl.com/8x2b96n0.

[16] C.A. McKim, The value of mixed methods research: a mixed methods study, J. Mix. Methods Res. 11 (2) (2015) 202–222, https://doi.org/10.1177/1558689815607096.

[17] J.W. Creswell, Qualitative Inquiry and Research Design: Choosing Among the Five Approaches, second ed., 2007. Retrieved from, https://bit.ly/2l9VLT.

[18] O.L. Fernandez, J.F. Azorin, The use of mixed methods research in the field of behavioral sciences, Qual. Quantity 45 (2011) 1459–1472, https://doi.org/10.1007/s11135-011-9543-9.

[19] V. Braun, V. Clarke, Using thematic analysis in psychology, Qual. Res. Psychol. 3 (2) (2006) 77–101, https://doi.org/10.1191/1478088706qp063oa.

[20] L.S. Nowell, J.M. Norris, D.E. White, N.J. Moules, Thematic analysis: striving to meet the trustworthiness criteria, Int. J. Qual. Methods 16 (2017) 1–13, https://doi.org/10.1177/1609406917733847.

[21] R.D. Goddard, M. Tschannen-moran, A theoretical and empirical investigation of teacher collaboration for school improvement and student achievement in public elementary schools, April (2007).

[22] S.A. Ostovar-Nameghi, M. Sheikhahmadi, From teacher isolation to teacher collaboration: theoretical perspectives and empirical findings, Engl. Lang. Teach. 9 (5) (2016) 197–205.

[23] E. Bondy, M.T. Brownell, Overcoming barriers to collaboration among partners-in-teaching, Interv. Sch. Clin. 33 (2) (1997) 112–115.