



# Influence of technological trends in the automobile industry on the information seeking behaviour of mechanics in Ghana

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Received: 8th September, 2023 - Revised: 15th May, 2024 - Accepted: 12th June, 2024

DOI: <https://dx.doi.org/10.4314/glj.v29i1.1>

## Abstract

*The purpose of the study was to determine how information and communications technologies influence the information seeking behaviour of artisans in the automobile industry in Ghana. Questionnaires made up of open- and closed-ended questions were used to collect data from 206 artisans in the automobile industry from the Ga North, Ga East as well as the Madina municipalities within the Greater Accra Region, Ghana, which have high population of mechanics. The low educational background of most mechanics in the information seeking and application of information to problem solving, affected their operations. Most mechanics had on-the-job-training instead of formal training, which informed their poor ICT skills relevant in their field of work. The high cost of relevant technology tools also demotivated most mechanics from acquiring them for their work. The use of ICT tools plays a major role in the activities of artisans in the current state of the automobile industry worldwide, and there is the need for governments to collaborate with some state agencies and non-governmental organizations in ensuring that these artisans are given the needed support in ICT training to make them more relevant in the discharge of their duties.*

**Keywords:** Information and communication technology, information seeking behaviour; auto-electricians; auto-mechanics; welders; sprayers; artisans

## Introduction

The automotive sector is considered as a major contributor to modern industrial economic development. The availability of vehicles promotes convenience in mobility of people and goods globally (Smith, 2023). The effect of the high demand for vehicles as a result of the popularity of road transport for movement of people, goods and services in Ghana, coupled with low purchasing power of a large proportion of the populace has resulted in the increased importation of used vehicles to support economic activities (Akuh & Agyeman, 2019). The

need for a vibrant automobile repair industry under such scenarios is therefore imperative.

In Ghana, there is a large artisanal industry which employs over one million people (Hilson et al, 2021), as well as a thriving second-hand spare-parts business activity which contribute about 65 and 66% respectively of the total revenue and employment to Ghana's economy (Aboagye, 2014). The classical approach to repair works on vehicular motors have either been mechanical or electrical. For instance, at the Suame Magazine in the Kumasi Metropolis, which is one of the popular places for apprenticeship

training in auto repairs in Ghana, the apprentices learn through observation and hands-on practice (Jaarsma et al, 2011). The Suame Magazine within the Kumasi Metropolis is a popular industrial area with an estimated 200,000 artisans working in 12,000 enterprises which is predominantly associated with auto repair (Agyei-Baffour et al., 2015).

In recent years, technological advances in the automobile industry worldwide have resulted in the integration of both mechanical and electrical as well as electronic components in most vehicles requiring the use of different diagnostic techniques/tools in the vehicle repair industry. Auto-mechanics are therefore expected to employ the right technique to detect defects, repair modern electronic vehicles using the appropriate scanning tools, thereby increasing efficiency and minimising expenses to vehicle owners. This requires that auto-mechanics understand and use ICT tools in the trade if they are to be efficient. According to Jaarsma et al. (2011) one major concern for the acquisition of skills at the Suame Magazine is the effect of ICT on vehicles and the need for artisans to acquire some level of technological skills to aid them in working on vehicles which are electronic in nature. It is against this background that the researchers sought to find out how technological trends influence the information seeking behaviour of artisans in the automobile industry in Ghana.

## **Problem Statement**

The automotive repair and maintenance industry undertakes tasks that ensure the smooth running of vehicles and its features. The lifespan of vehicles is prolonged, and their performance enhanced when they are constantly repaired and maintained (ReportLinker, 2018). Artisans in the automobile industry usually acquire their training mostly in classroom settings, and at the workplace (Barber, 2003; Olawale, 2024). After having gone through such training programs, it is expected that they will be able to apply the knowledge gained to undertake correct diagnostics on cars and be able to prescribe acceptable solutions.

Modern technological trends in automobile manufacturing are moving towards the incorporation of more electronic components into vehicles. The make-up of these vehicles has become so complex that car manufacturers are increasingly introducing new technology which needs to be learned by artisans to be able to maintain such cars. An artisan servicing the automobile industry needs to know how to undertake troubleshooting, variable valve timing and fuel

injection (The International Association of Machinists and Aerospace Workers, n.d.).

Workshop operators and apprentices need to adjust their knowledge by using emerging technologies to gain competitive advantage in the discharge of their services (Trivedi & Srivastava, 2022). Whereas some of the auto-repairers in Ghana are attached to companies which would require them to have certain basic knowledge in current trends in automobile technology, majority of these artisans have their own shops, mostly by the roadside where their services could be easily accessed. Most of these “roadside” auto-mechanics, in many instances, apply memorized procedures to repair an identified challenge through try-and-error. Affected customers of such shops are made to bear the total cost of such repairs.

Though several ICT tools are available in the face of the fast advancement in technology in the automobile industry to aid artisans with the requisite information to properly diagnose challenges of modern electronic vehicles needing some form of repair works, one challenge that artisans face is how to access the relevant information.

## **Review of existing literature**

### ***A brief history of the auto-mechanic trade***

Before the introduction of cars, transportation was either by horses, horse-drawn carriage, train, walking, and ship. At the beginning of the 20th century, automobiles were introduced and manufacturers made hand-fitted vehicles. Auto repair businesses were non-existent and vehicle owners engaged the services of machinists, plumbers, and bicycle mechanics to repair or fabricate vehicle parts (The International Association of Machinists and Aerospace Workers, n.d.). Wealthier vehicle owners engaged the services of chauffeur mechanics as servants who drove and maintained their vehicles. After the 1920's, the manufacturing of cars increased, resulting in the growth of the car repair industry as an independent or as dealerships for specific automotive industry (The International Association of Machinists and Aerospace Workers, n.d.). It has been reported by the Macquarie Bank that 88.1 million cars and light vehicles were sold in 2016 globally (Ulkhaq et al, 2018).

Also, the engagement of automotive service technicians is anticipated to grow at a rate of 6 percent between 2016 and 2026, a growth that is phenomenal compared to the growth being experienced in other occupations (Google, 2018). In the United States of America, there exist about 1.5 million mechanic

jobs and 800,000 of them (53%) are auto-mechanics (Google, 2018).

In Africa, poverty among the greater percentage of the citizenry is high and as such most people do not have the requisite skills to enable them engage in productive ventures and earn high income (Handley et al., 2009). The availability of formal vocational training systems is inadequate due to barriers in terms of entry qualifications as well as the cost of accessing such trainings (Al-Saaideh, 2016). Majority of people who want to learn a trade are engaged in the informal sector (ILO, 2010). According to the Ghana Statistical Services, 2021 population and housing census in Ghana, unemployment among the youth is high and stands at 19.7%. Also, there is the challenge of engaging the youth into the labour market (The African Center for Economic Transformation, 2023). Therefore, majority of those who do not have the opportunity of furthering their education due to limited resources opt to learn a trade in the informal sector to be able to earn a living. Most of the wayside auto-mechanics in Ghana are engaged in the informal sector (Awortwe-Abban, 2016:315).

In Ghana more business opportunities exist in the auto repairs industry due to the number of vehicles that are imported into the country annually. Over one million vehicles of all types were imported into Ghana between 2005-2016. Of this fleet, 80 percent were second-hand cars with obsolete technology (Ghana News Agency, 2018). A greater proportion of these vehicles are mostly repaired and maintained by artisans who are found by the roadside (Awortwe-Abban, 2016). The activities of artisans who service the automobile industry consist of removing and repairing old or damaged parts of vehicles such as pistons or rods in the engine, rebuild faulty assemblies such as steering systems, repairing or replacement of brakes, cooling, heating and electrical systems, replacement of transmissions, shock absorbers, distributors, radiators, ignition systems, other electronic circuit systems and also fixing other vehicle accessories as windshield wipers, mirrors and videos (Career Trend, 2018). Artisans operating in the automobile industry repair and maintain motor vehicles which also includes auto electrical works (ILO, 2010). The work of modern artisans require that they have to employ computerized diagnostic equipment to be able to identify a mechanical, electrical and/or electronic challenge and perform the needed maintenance service (Awortwe-Abban, 2016).

Some opportunities exist to train artisans in

Ghana. These include Kumasi Technical Institute (KTI) which offers a full-time and a part-time program. The National Vocational Training Institute (NVTI) offers a similar full-time program in car mechanics; the NVTI offers the opportunity to formalize skills through certification by taking a practical exam. However, most artisans have not been able to take advantage of this formal training due to the lack of funds (Jaarsma et al, n.d.). In Ghana, a greater proportion of artisans in the various garages have had extensive years of auto repair experience but they do not have the know-how to diagnose and repair modern vehicles as a result of low levels of educational and technical training. Other challenges that they face include their inability to identify and use modern diagnostic instruments, manufacturers manual, computers and internet, inadequate working tools, equipment and logistical support (Akpakpavi, 2014).

Modern vehicle repairs in Ghana can be enhanced when training institutions and the tertiary setups, Polytechnics, the Ghana Institution of Engineers, Gratis Foundation, National Board for Small Scale Industries (NBSSI), now Ghana Enterprise Agency (GEA), extend assistance particularly in the form of education, training and equipment to these local garages. This will enable them to remain in business and prevent garage closures due to their inability to repair modern vehicles (Akpakpavi, 2014). Apprenticeship in the informal sector may not be tied to any curriculum as done in the formal sector (Jaarsma et al., n.d). In most of the garages, the younger apprentices, on a daily basis, learn from the master apprentices. The knowledge gained is later on applied to repair and maintain broken down vehicles. New apprentices at most of these garages gain knowledge of the anatomy of cars through constant observation. However, the introduction of electronic equipment in modern cars requires that one ought to have the skills that will meet the changing trends of technology. Workshop operators and apprentices need to adjust their knowledge by using emerging technologies to gain competitive advantage in the discharge of their services (Trivedi & Srivastava, 2022). In this regard, the Suame Magazine Industrial Development Organization (SMIDO), in Kumasi, has set up an ICT centre that gives additional training to workers in the area of ICT (Jaarsma et al., n.d). The make-up of vehicles has become so complex that car manufacturers are increasingly introducing new technology which needs to be learned by artisans to be able to maintain such cars. An artisan servicing the

automobile industry needs to know how to undertake troubleshooting, variable valve timing and fuel injection (The International Association of Machinists and Aerospace Workers, n.d.).

Customers get attracted to a particular artisan when he/she exhibits the right attitude in the discharge of his/her duties and also exhibits professionalism (Awortwe-Abban, 2016). It is the expectation of vehicle owners that artisans are competent, honest, time conscious and act in a more professional way (Awortwe-Abban, 2016). Their level of competence will depend on how they access the right information to aid them in the performance of their duties. Industrialists most of the time, depend on the information that customers provide which guide them in the design of products as well as the provision of services. The information provided makes such industrialists more competitive and 'perform above mediocrity' (Awortwe-Abban, 2012:54). Customers' association with artisans who service their cars well will be based on their competency, trustworthiness and their prompt attention to the work that they do (Awortwe-Abban, 2016).

### **Categories of artisans in the auto repair industry**

#### ***Auto-mechanic***

An auto-mechanic, also referred to as auto-technician, is a mechanic who specializes in the maintenance of cars. Their training programs are developed both in the classroom and at the workplace (Barber, 2003). Their job involves fixing a particular part of a vehicle or the replacement of more parts. A mechanic's job consists of the basic vehicle maintenance of malfunctioning cars and also engages in preventive maintenance where some parts of the vehicle are replaced before the malfunctioning sets in.

In the face of current technological developments, there has been a shift of the duties of the mechanic from a purely mechanical one to that which is more electronically based. The make-up of some vehicles due to their complexity requires that mechanics also broaden their knowledge skills to one which is more encompassing than the limited knowledge available in the past. For mechanics to be able to carry out very comprehensive diagnostics of vehicles, some automobile dealers and selected workshops have provided sophisticated diagnostic computers as part of the teaching methods (Wikipedia, 2018; Akuh & Agyeman, 2019; Olaitan & Ujevbe, 2020).

#### ***Auto electricians***

The major activity that auto electricians are engaged in is in installation, maintenance as well as repairing electrical wiring and electronic systems in vehicles (Careersnz, 2018; Victorian Skills Gateway, n.d.). The primary duty of an auto electrician is to employ electronic diagnostic equipment to diagnose an electrical issue on a vehicle and solve it. The following are some duties and responsibilities: perform diagnostic electrical tests as needed; undertake electrical repairs on various vehicles; install new interior electrical systems; test headlight alignment and intensity and operate hand and power tools (Jobhero, 2018). There are several tools that are needed to carry out effective diagnostics and these include the following: power tools which auto electricians employ include electronic screwdrivers and drills, to install electrical systems within vehicles; voltage or current meters which are used to examine the flow of electric current to the several electrical systems within a vehicle. Such systems include headlights, GPS and sound systems; and stripping tools – which are used to remove and replace electronic wiring (Jobhero, 2018).

An auto electrician employs several technical skills for undertaking a task and must have an in-depth knowledge of electronic and sophisticated electrical systems that come with different cars. Among the several skills an auto technician needs are: Firstly, they should be conversant with diagnosing electrical glitches in automotive vehicles, solve complicated problems, install electrical systems, work in a changing environment and operate electronic diagnostic equipment among others (Jobhero, 2018). The duration for their training is between 3-4 years. Auto electricians are engaged in the following areas: specialised auto-electrical workshops, motor vehicle dealerships, motor vehicle servicing companies and automotive engineering workshops. About 20% of auto electricians are self-employed and 14% own businesses that have engaged others (Careersnz, 2018).

#### ***Welders***

Welders undertake several activities that aid in the total structural repair and fabrication on various vehicles and equipment. A trained welder should have an in-depth knowledge in the following areas: stick, arc, MIG, laser, electron beam and gas welding among others (Hennik Research, 2021). Skills that welders require include time management, personal relation/customer service, and judgement/decision making and computer skills (Indeed, 2023)

A person wishing to become a welder must have at least a combination of education and experience that are equivalent to a high school diploma and at least 3-5 years of responsible welding experience. A welder should be able to employ standard welding and shop tools for executing complex welding repairs, fabrication and modification work, ability to communicate ideas verbally and ability to perform basic mathematical calculations (Indeed, 2023)

### *Sprayers*

The work of the sprayer mainly includes the repair, as well as the application of paint to the body and frames of motor vehicles. This involves the repair of the body and frames of motor vehicles. Due to incidents such as road accidents together with issues such as poor road infrastructure, driving habits and traffic congestion among others, the demand for this service is on the increase (ILO, 2010). In the face of current technological trends, it is also important that sprayers upgrade the skills by acquiring the requisite knowledge to boost their sector.

### *Upholstery*

With the rapid changes in the socio-economic structure of our society, the uses of textiles are not just limited to the making of apparels. Automotive textiles are in high demand not only for the enhancement of aesthetics of automotive, but instead these textiles are adopted for sensual comfort and the safety of the occupants of vehicles (Singha, 2012).

Being able to operate in this industry requires one to undergo certain forms of trainings such as vehicle framework, safety procedures, tools and equipment, modification and repair, sewing techniques, fabric manipulation as well as hands-on workshops (Study.com, n.d.). One needs special skills to be able to operate in this area. The person must have a good memory and a lot of time to be able to become perfect (Trupin, 2017).

Upholstery materials are generally made from leather, cotton, plastics as well as other fabrics. Fashion trends has greatly impacted on the development of product qualities in terms of the choice of the fabric as well as the raw materials. The choice of material is greatly influenced by the durability as well as the cost (Buhu et al., 2022). In recent years, there has been the design and application of yarns with a much more focus on aesthetic designs (Buhu et al., 2022; Yassin, 2023) and visual standards (Yassin, 2023). Thus, upholstery requires an in-depth knowledge of varying techniques,

and it is important that such knowledge is applied well in order to obtain the relevant result.

### ***Theoretical framework-Information seeking behaviour model***

One of the critical elements in the task of auto-mechanics is information. According to Chukwuemeka, Olayide, Gabriele, Adeniyi and Adesoji (2022) information is the critical factor for the growth and success of small-scale business enterprises. According to Wilson (1999)'s model information seeking behavior is informed by the context, the system, the sources of information the personal circumstances of users, their social role in the person's work life and the environment (that is, political, economic and technological).

Kumar and Tholkappian (2013) and Chukwuemeka et al. (2022) justify Wilson (1999)'s theory in that it provides adequate guidelines for understanding the information seeking behavior of users by recognizing the needs of the users, the services and the ways to satisfy these needs. Thus, Wilson (1999)'s theory becomes an appropriate model to understand the information seeking behavior of auto-mechanics.

Figure 1 shows the relationship among the various aspects of Wilson's model in addressing information needs. According to the theory, information seeking behavior is informed by perceived information needs of users, which then results in demand either for formal or informal sources or channels. These demands for information may either result in success or failure in finding relevant information. If the process is successful, the users' information needs are satisfied; and if it fails, the user becomes dissatisfied and would be prompted to adopt different information systems to continue his or her search. The findings from the study showed that a lot of the artisans tended to depend on their friends, colleagues or people they know and therefore, they are satisfied with that source of information, thus confirming Wilson (1999)'s theory that demand for formal or informal sources of information is dependent on the perceived success of information needs being met.

Gichohi (2016) asserts that Wilson's theory is useful and supports the marketing communication and customer care in that a satisfied user or consumer of a product or service will share the same information with others, thus leading to more fruitful enterprises.

However, Chukwuemeka et al. (2022) state that a key criticism of the theory is its overgeneralization,

in that it may not adequately apply to all spectrum of knowledge. However, this study corroborates Wilson's theory because the respondents tended to rely on informal sources of information to satisfy their information needs.

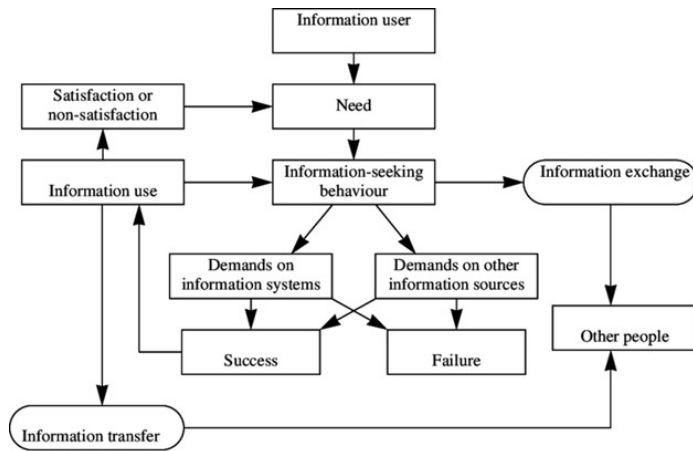


Figure 1: Wilson's model of information seeking behavior (Wilson, 1999)

## Methodology

The snowballing sample technique was employed to collect data from 206 mechanics according to a predetermined criterion from the Ga North, Ga East as well as the Madina Municipalities within the Greater Accra Region over a three-month period using questionnaires. The municipalities were selected taking into consideration the concentration of auto-mechanics within the Greater Accra Region, the COVID-19 restrictions on movement and human interactions, as well as the travel distance from the researchers' area of operation due to limited finances for this work. Care was taken to avoid location bias by not sampling from the same locality. Thus, the researchers were able to account for trends and patterns applicable to a wider geographical area.

A total of twenty (20) shops were visited. Currently, there is no statistics on the total number of artisans in Accra. The researchers therefore sampled 206 artisans from 20 shops in Accra. The respondents were randomly selected based on their availability at the time of the data collection and also their willingness to engage with the researchers. There were 10 respondents each from 19 shops and 16 respondents from the twentieth shop. Due to the risks associated with the Covid-19 pandemic, and to follow the National Covid-19 protocols, permission was sought from the respondents in each of the workshops visited and the questions read out while the research team filled out their responses. The respondents thus

did not handle the questionnaires themselves.

Two types of artisans operating in the automobile industry were considered for this study. These included the following:

### • SME's in the automobile industry

These are artisans who fall under the small and medium-scale enterprises in the industry. They consist of artisans who have set-up their own businesses and have established themselves by the "road side" or work from small workshops. It also includes others whose activities are more mobile and offer services to their clients without the vehicle being brought to the garage (Wikipedia, 2018). They receive direct payments for their services. Artisans that fall under this category include auto-mechanics, welders, auto electricians, sprayers and upholstery makers.

### • "Professional" artisans (attached to companies)

The "professional" artisans are those attached to companies and see to the servicing of the vehicles owned by these companies. These artisans are remunerated from the companies' coffers.

## Data analysis

The data collected was analysed as descriptive statistics using the Statistical Package for the Social Sciences (SPSS) version 20. The results were then presented as frequencies and percentages.

## Results

### Demographic profile of respondents

Out of the 206 responses to the question about age, most of the them (45.1%) were between 21-30 years, with only 8.7% being between the ages of 10-20 years. Of those answering this question only 1 was female constituting 0.5% of the respondents. Table 1 also shows that majority of the respondents (56.8%) were single, while 38.8% were married, with only 1.0% being widows.

Table 1: Demographic profile of respondents

Demographic profile	Frequency	Percentage
<b>Age category (years):</b>		
10-20	18	8.7
21-30	93	45.1
31-40	61	29.6
> 40	33	16

**Gender:**

Male	201	97.6
Female	1	0.5

**Marital status:**

Single	117	56.8
Married	80	38.8
Divorced	4	1.9
Widowed	2	1.0

**Educational background:**

No formal education	32	15.6
Junior Secondary School graduates	85	43.1
Senior Secondary School graduates	16	7.8
Junior Secondary School dropouts	16	7.8
Senior Secondary School dropouts	38	18.4
Technical School graduates	13	6.3
Polytechnic graduates	1	0.5
University graduates	4	1.9

Also, majority of the respondents (41.3%) were Junior Secondary School (J.H.S.) graduates, followed by a significant percentage (25.8%) who were school dropouts [i.e. J.H.S. (7.8%) and S.H.S. (18.4%) dropouts]. Interestingly only a small percentage were Technical School graduates (6.3%) or Polytechnic graduates (0.5%) (Table 1).

**How did one become an automobile artisan?**

This was a multiple-choice question, and respondents had the option of selecting more than one option. Two hundred and six (206) persons responded to this question. Figure 2 shows that 76.2% had personal interest to learn a mechanic-related job, followed by 24.3% who took up the trade because they did not have the requisite funds to further their education. About 15% of the respondents said they took up the trade through encouragements from family members due to the fact that they showed early signs of interest in working with machines. A few of the respondents (1.5%) however did not provide any response.

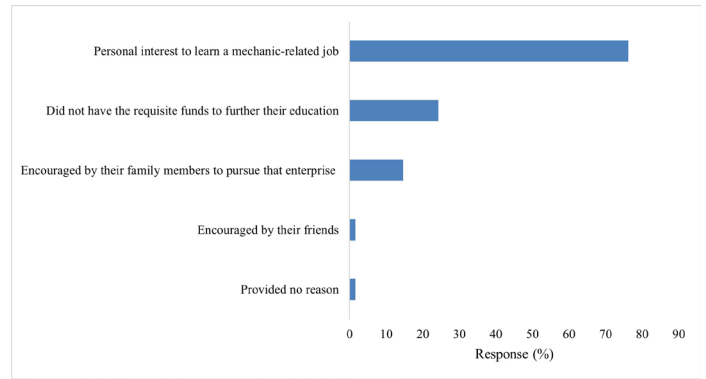


Figure 2: Reasons for becoming an auto-mechanic

**What is your category in terms of experience on the job?**

Regarding the category of their experience, majority of the respondents (43.7%) indicated that they were “Masters”. This was followed by 28.6% who indicated that they were Chief Apprentices, and Junior Apprentices (26.7%).

**What is your area(s) of car specialty and number of years of experience?**

Artisans in the automobile industry have cars they specialize in when it comes to repairs. Of those responding to this question 50% were auto-mechanics, 6.8% were sprayers, 25.7% were welders, 4.4% were into upholstery and 11.7% were auto electricians. Table 2 shows the number of years of experience in their areas of specialty. Over 50% of auto-mechanics had between 1-5 years’ work experience; followed by 16.2% with for 6-10 years’ work experience. Only 1% had over 30 years work experience.

Of the respondents involved in spraying 74.1% had been sprayers between 6-10 years, with none having over 30 years work experience. While majority of welders (48.6%) had 11-15 years of experience, majority of auto electricians (48%) had over 30 years work experience. All the respondents who were into car upholstery however indicated that they had 16-20 years of experience (Table 2).

Table 2: Years of experience of respondents

Characteristics	Years of experience (%)					Total
	1-5 yrs	6-10 yrs	11-15 yrs	16-20 yrs	> 30 yrs	
Auto-mechanic	54	16.2	5.1	7.1	1	99
Sprayer	14.8	74.1	3.7	7.4	-	27

Welder	14.3	14.3	48.6	8.6	14.3	35
Uphol- stery	-	-	-	5.8	-	12
Auto electrician	16	16	12	8	48	25

#### What brand(s) of cars do you specialise in?

This was a multiple-choice question, and respondents had the option of selecting more than one option. The findings show that nearly 75% of the mechanics specialized in the maintenance of Kia cars. Almost an equal number (73.8%) specialised in Toyota cars with BMW cars (0.5%) recording the least number of respondents (Figure 3)

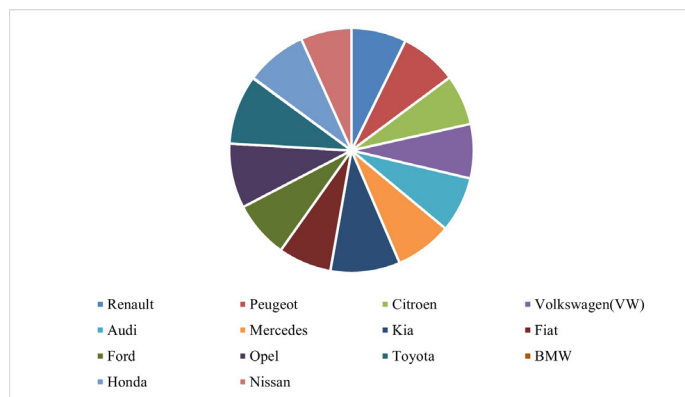


Figure 3: Brand of cars

A follow-up question (also a multiple-choice question with respondents having the choice to select more than one option) sought to find out about the country of origin of the cars that these mechanics specialized in. Again, Japanese and Korean cars had similar number of respondents with German cars having the least number of respondents (Table 3).

Table 3: Country of origin of cars

Country of origin of Cars	Frequency	Percentage
Japan	126	61.2
Korea	121	58.7
Germany	91	44.2
Europe	97	47.1
America	95	46.1

#### Is your workshop owned by an informal (individual) or by a formal company?

Figure 4 shows the responses to the question regarding within which enterprise outlet the respondents plied their trade. There were 201 responses to this question. Figure 4 shows that close to 90% of the respondents were engaged at individual maintenance outlets.

A follow-up question which sought to find out whether the respondents had had a previous experience of working with any formal company indicated that only 15.0% of the respondents had worked with a formal company before.

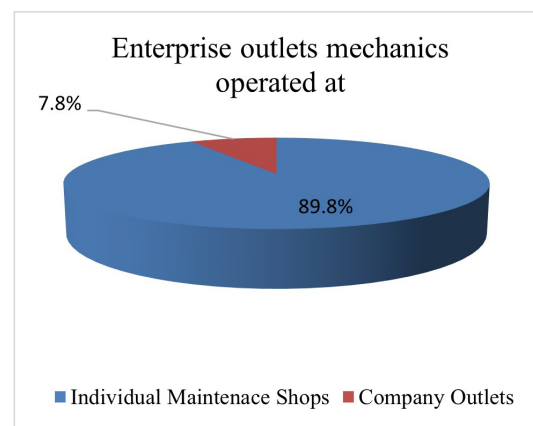


Figure 4: Enterprise outlets mechanics operated at

#### What type and mode of training have you had?

The type of training the respondents had had is presented in Figure 5. Figure 5 shows that 87.4% of the respondents had on-the-job training, while just under 2% did professional training courses.

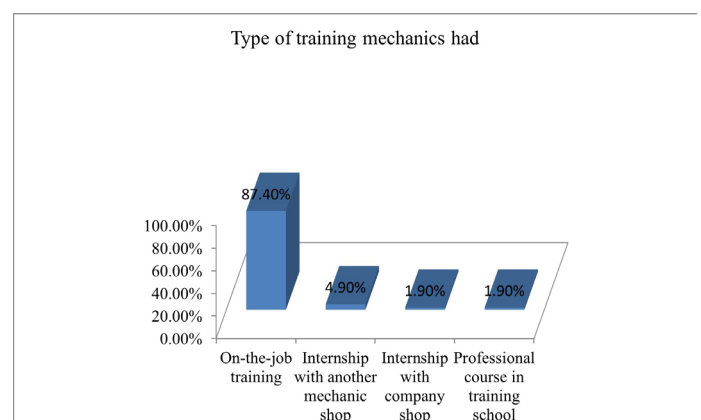


Figure 5: Type of training mechanics had

A follow-up to the above question, with the possibility of multiple answers indicated that 92.7% of the respondents learnt through observation. This was followed by 79.1% who learned through participation



at the various workshops. And 32.5% learnt through assignments, while 11.2% of them learnt their trade through lectures.

#### **Ownership and purpose for using mobile devices**

Majority of the respondents (92.2%) owned one type of mobile device or the other (respondents had the option of multiple answers), with 65% owning smart phones. A significant number of respondents (32.5%) owned basic phones. Only 3.4% owned diagnostic machines (Table 4). However, just 56.3% of the respondents owning mobile devices had internet connectivity.

*Table 4: Devices owned by respondents*

Type of device owned	Frequency	Percentage
Tablets	5	2.4
iPad	1	0.5
Laptops	3	1.5
Diagnostic Machines	7	3.4
Basic Phones	67	32.5
Smart Phones	134	65

Majority of the respondents (87.9%) used their devices to make and receive calls. Those who used their devices to search for information online to do proper diagnostics on vehicles constituted only 18.9% of the respondents (Table 5).

*Table 5: Purpose for using mobile devices*

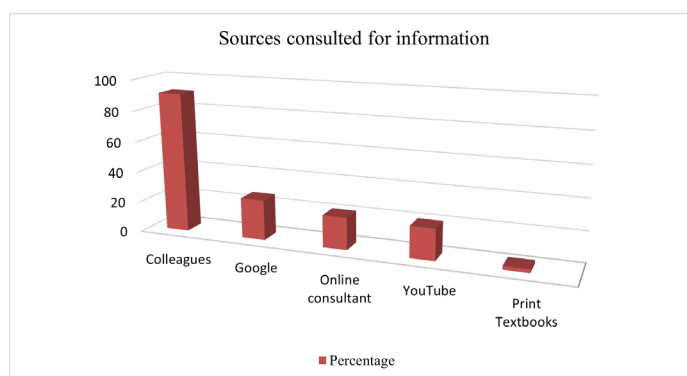
Purpose	Frequency	Percentage
Make/ receive calls	181	87.9
Take photos	114	55.3
Watching videos	83	40.3
Social networking (Facebooking)	55	26.7
Instant messaging	83	40.3
Play games	55	26.7
Watch TV	21	10.2
Listen to radio	90	43.7
Search information online	39	18.9

A little over half of the respondents (51%; n = 197) indicated that they have never used any ICT tool for diagnostic purposes. However, 35.9% of the respondents indicated that they had at one point

in time used ICT tools to aid their work (Table not shown).

#### **Sources consulted for information**

Respondents were to indicate the sources they usually consult for information. This was a multiple-choice question, and respondents could select more than one option. Among the sources of information were colleagues, family and friends engaged in a similar trade, Google, online consultants, YouTube, social media and textbooks. Majority of the respondents (90.8%) indicated consulting their colleagues, family and friends engaged in a similar trade for information business. This was followed by those who consulted Google (26.2%); the least constituting 2.4% consulted sources like printed textbooks (Figure 6).



*Figure 6: Sources consulted for information*

As a follow-up to this question, respondents were to indicate the format of information that they preferred with the option of multiple answers. Majority of the respondents (69.4%) preferred videos, followed by images (60.7%). Texts was the least preferred format (7.8%) as indicated in Table 6.

*Table 6: Preferred information format*

Preferred information format	Frequency	Percentage
Videos	143	69.4
Images	125	60.7
Audio	124	60.2
Text	16	7.8

#### **Confidence level with the use of ICT tools**

When respondents were asked to rate their confidence level in respect of using ICT tools only 8.7% were confident in the use of ICT tools with the

majority (31.1%) rating themselves as poor when it comes to the use of ICT tools (Figure 7).

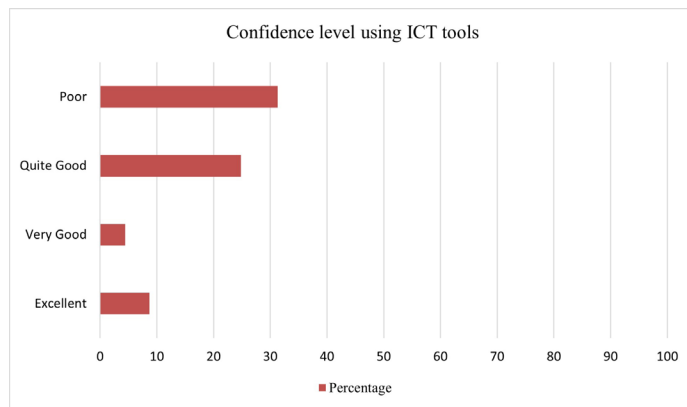


Figure 7: Confidence level using ICT tools

### Required training by respondents

With regards to the kind of support that they need to enable them effectively use the right ICT tools, majority of the respondents (51%,  $n = 202$ ) indicated that they needed more training in the use of ICT tools to aid them do proper diagnostics on cars and proffer the right solution; 22.3% each needed ICT tools and financial support, and 4.4% indicated that they needed further education on the use of ICT tools in car repairs and maintenance.

### Factors affecting information seeking behaviour

Majority of the respondents (59.2%) lacked the requisite computer/search skills to look for information online. Poor internet connectivity (15.5%) and irregular electricity (14.6%) were also indicated as factors affecting information seeking by the respondents (Figure 8).

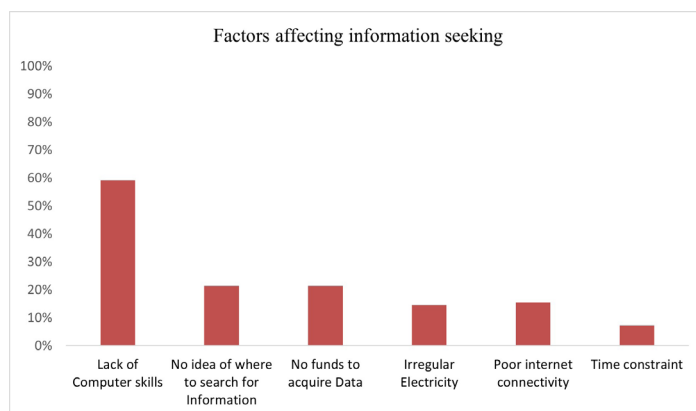


Figure 8: Factors affecting information seeking

## Discussion

### Educational background and motivation to becoming an artisan in the automobile industry

Education serves as a driver for economic transformation; and the high level of informal employment in Ghana and some African countries are due to the low levels of education (Alagidede, Nketiah-Amponsah, & Baah-Boateng, 2013). The findings of this study with a majority of respondents having little or no education corroborate that of Yankson and Owusu (2015); and Ziblima et al. (2018) who reported that auto-mechanics, welders, and auto electricians in Ghana usually had basic level of education with most of them being school drop-outs. Unlike the technical classroom setting which allows these artisans to acquire some skills, Akuh and Agyeman (2019) also state that majority of the artisans in the automobile industry in Ghana have acquired their skills through several years of apprenticeship. The low educational levels of these artisans could also be a barrier to their coping with the rapid advances in the technological changes in their profession. Their inability to read and write will be a barrier to appreciating manuals that come with vehicles, as well as identifying the parts of certain cars. It was therefore not surprising that most of them operated in the informal sector.

The high level of personal interest to opt for a trade as automobile repairers could either be attributed to the less interest, they might have had to acquire formal education, or financial constraints to further their education thereby preventing them from being engaged in white collar jobs later in their lives. Until recently, when the Free Senior High School education was introduced, one needed enough funds to support children at school-going age.

Broken homes were another factor that did not allow some school-going children to realise their dreams in the future (Pajibo & Tamanja, 2017; Mayowa, 2021; Smith, 2023). Therefore, these affected children who had no option than to learn a trade that could support them financially soon. Some of the respondents showed early signs of working with machines and were encouraged by their family members to learn a trade in this regard. A few of the respondents (1.5%) were motivated by their friends to engage in the automobile repair trade. This is a clear indication that one needed to have a strong passion for the automobile industry to become a successful automobile repairer (Center for Employment Training, 2023).

### ***Previous training, years of experience and required training for efficient use of vehicular diagnostic tools for auto repairs and maintenance***

Although a greater number of the respondents had worked for about 10 years, it was expected that they will have all the requisite know-how to work on all types of cars. However, considering the low educational background of most of the respondents, it was going to be challenging to work on most of the vehicles that are electronic in nature resulting in them employing the try-and-error methods such that most of the vehicles they worked on were not fully road worthy. However, a study by Bafaneli and Setibi (2015) reported that on-the-job training was considered as very productive in the training of workers. The current study shows that majority of the respondents developed their skills through practical trainings received at their various workshops. This corroborates the findings of Ziblima et al, (2018) as well as Smith (2023) that practical trainings are the common means through which most artisans develop their skills.

Thus, majority of the respondents in the current study indicated that they needed more training in the use of ICT tools as this will help them to do proper diagnostics on vehicles especially those that are electronic in nature. Others, on the other hand, needed ICT tools themselves to work with. Others, realising the importance of ICT tools in modern vehicular repairs and maintenance, also indicated that they needed to further their education that could aid them in their day-to-day activities.

### ***Ownership of mobile devices and purpose for using mobile devices, sources consulted for information and confidence level with regards to use of ICT tools***

The developments in information and communications technology have impacted so much on the make-up of cars. There are currently more electronic vehicles in the system, and it was expected that automobile repairers who took part in the study will possess some diagnostic scanners that could support accurate and reliable diagnosis, thereby lowering maintenance costs, maximizing safety and reducing the frequency of repairs. Although majority of the respondents owned mobile devices only 3.4% owned diagnostic scanners/machines; and a significant number also had issues with internet connectivity or regular electricity. The findings of the current study where only 18.9% searched for information online to aid their work, corroborate earlier studies which indicated that a greater number of automobile repairers used

their mobile devices for social networking (Chippis et al, 2015) and entertainment purposes (Davidovitch & Yavich, 2018; Yamaguchi, 2023). This is a clear indication that majority of the repairers will have to depend on previous knowledge as well as a try-and-error attempts when working on vehicles. Librarians as custodians of information use could contribute to improve the current state of affairs by patterning with NGOs and governmental organizations like GEA to support these artisans to improve the use of their mobile devices for business purposes. Chukwuemeka, Olayide, Gabrie, Adeniyi and Adesoji (2022) have stated that libraries as institutions responsible for information resources, sources and services to users, through the provision of business information which is a critical factor for the growth and success of small-scale business enterprises, have become indispensable partners in this regard. Chukwuemeka et al. (2022) go further to say that public libraries are in a unique position to provide this service as they are accessible to the public without regard to their background, age, status, race or creed. Librarians could therefore focus some attention to the provision of business information, particularly to the SME sector to help improve the performance of this sector of the Ghanaian economy.

The pattern in the current study where majority of the respondents consulted their colleagues when searching for information could be attributed to the learning environment within which they acquired their knowledge. Majority of them acquired their skills from the mechanic shops they were attached to and learnt from both their “masters” and senior apprentices. In effect, their colleagues will be the first point of call when they needed any assistance relating to their work.

Being confident in the use of ICT tools enables users to unearth certain hidden opportunities which invariably promote learning (Ghavifekr et al., 2016). The low confidence levels of the respondents in this study in the use of ICT tools implies that it will be very challenging for them to rightly diagnose and repair the current crop of electronic vehicles on the market. The high preference for videos and images as information formats in their line of duty has greater implications for policy makers, NGOs and librarians who have interest in upgrading the skills of these workers.

### ***Factors affecting information seeking behaviour***

Majority of the respondents lacked the requisite computer/search skills to look for information online. This finding corroborates a similar study by

Abubakar and Abutu (2019) and Desta et al. (2019). The implication of this finding is that there is the need for the Government and Non-Governmental Organizations to establish training centres to train some of this workforce found in the automobile repair industries. Others did not know where to search for information to meet their information need, and this is supported by findings from Makinde, Jiyane and Mugwisi (2019) that artisans have less knowledge when it comes to the sources of information to meet an information need. Poor internet connectivity, irregular electricity supply and time constraint reported in this study have also been reported in similar studies by Braimah and Amponsah (2012), Desta et al. (2019) and Makinde et al. (2019).

## Conclusions

From the above, it can be concluded that there have been massive changes in the work environment of automobile repairers due to technological advancements in the 21st century. There has been great evolution in the make-up of cars from a purely mechanical to electro-mechanical. It is expected that automobile repairers be IT literates. This will enable them to have greater command over the use of technology to do proper diagnostics and proffer the right solutions.

The findings from this study have also revealed that ICT has a great impact on the activities of mechanics in Ghana. A careful analysis of the findings of this study portrays some issues that need to be considered critically by the Government of Ghana as well as governments in other developing countries so long as the activities of motor mechanics exist. The effects of education on the activities of these mechanics need to be given the much-needed attention. There is therefore the need for all Governments in developing countries to collaborate with some state agencies, Non-Governmental Organizations and librarians (who could support in the provision of business information), in ensuring that these artisans are given the needed support in the area of ICT training as well as improving their business information needs to make them more relevant in the discharge of their duties.

## Recommendations

It is recommended that librarians should focus some attention to the provision of business information to SMEs. For example, libraries could assist auto-mechanics to circumnavigate the varying information available to be able to arrive at the relevant resources to

meet their information needs.

In addition, librarians could partner with SME support agencies like GEA to provide some form of instruction and workshops to assist these auto-mechanics develop information literacy skills including how to navigate digital platforms to be able to use digital tools effectively.

Lastly, there should be some form of collaboration between librarians, auto-mechanics and other stakeholders to identify the information needs of auto-mechanics so as to link them up with the right experts, peers as well as professional organizations to aid them to offer efficient and effective services to their clients.

## Practical implications

The study has identified a major challenge in the maintenance of modern (electronic) vehicles and how mechanics in that sector could be supported technologically. Wrong diagnostics on electronic vehicles can affect the solutions that artisans proffer and this will affect vehicles' overall performance resulting in the increase of road accidents.

## Limitations and areas for further studies

The study employed the quantitative approach only and therefore missed out on the underlying reasons why ICT tools were less used among artisans in the automobile industry in Ghana. Future studies could consider using a mixed method approach to unravel reasons behind the challenges faced by these artisans.

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