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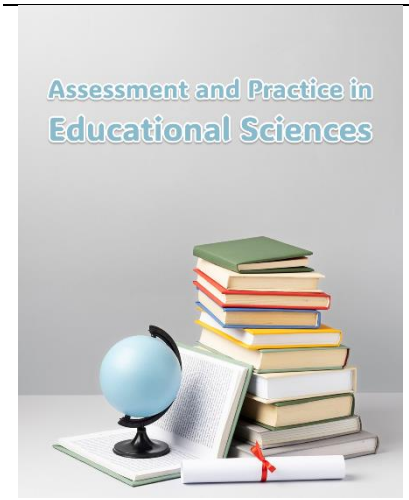

Identifying the Dimensions and Components of the Curriculum Model for After-Sales Services in Iran's Automotive Industry

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ABSTRACT

The objective of this study was to identify the dimensions and components of a curriculum model for after-sales services in Iran's automotive industry based on the perspectives of experts and key informants. This study was conducted using a qualitative research design with a grounded theory approach. The study population consisted of experts in automotive after-sales services and curriculum-related professional training in Iran. Participants were selected through purposive and snowball sampling. Data were collected through semi-structured interviews with 18 experts, including senior managers, training managers, technical instructors, inspection specialists, customer satisfaction supervisors, and academic experts familiar with curriculum planning. The interviews were conducted face to face and lasted approximately 40 to 60 minutes. Data collection continued until theoretical saturation was achieved. The interviews were audio-recorded with participants' consent, transcribed verbatim, and analyzed through open, axial, and selective coding using manual coding and MAXQDA 10 software. The trustworthiness of the findings was ensured through credibility, transferability, dependability, and confirmability criteria. The qualitative analysis led to the identification of the main dimensions and components of the curriculum model for after-sales services in Iran's automotive industry. The extracted dimensions included efficient and effective management, skilled and trained human resources, use of modern technologies, training development, evaluation, and customer satisfaction. These dimensions showed that the curriculum model should not be limited to technical education, but should integrate managerial, technological, educational, evaluative, and customer-oriented components. The findings indicated that a successful after-sales service curriculum requires systematic planning, competency-based training, practical learning, continuous assessment, technological adaptation, and attention to customer expectations. The results showed that the curriculum model for after-sales services in Iran's automotive industry is a multidimensional and integrated framework. Designing such a curriculum can help improve workforce competence, service quality, organizational coordination, customer satisfaction, and the overall effectiveness of automotive after-sales service systems.

Keywords: Curriculum Model; After-Sales Services; Automotive Industry; Grounded Theory; Qualitative Research; Professional Training; Iran

Introduction

After-sales services have become one of the most decisive arenas of competition in contemporary industries, particularly in the automotive sector, where the value of a product is no longer limited to its technical features at the point of sale. In automotive markets, customers evaluate companies not only through the vehicle itself, but also through maintenance quality, technical

support, spare parts availability, warranty responsiveness, customer communication, service network capability, and the reliability of repair and diagnostic processes. In this context, after-sales service functions as a strategic mechanism for customer retention, brand trust, repurchase intention, and long-term market sustainability. Empirical evidence from different service sectors shows that after-sales service quality influences customer satisfaction, loyalty, perceived value, repurchase behavior, and word-of-mouth communication (1, 2). In industries where technical products require continuous maintenance and support, after-sales service becomes even more important because the customer's experience continues throughout the product life cycle. In the automotive industry, the quality of after-sales services can reduce brand switching, strengthen customer confidence, and transform the service network into a source of competitive advantage (3).

The automotive industry is among the sectors in which after-sales services require complex coordination among technical, managerial, educational, technological, and customer-oriented components. This complexity is particularly visible in markets such as Iran, where automotive companies, authorized dealerships, independent repair centers, parts suppliers, technical trainers, inspection bodies, and customer-service units all participate in shaping the customer's post-purchase experience. The efficiency of after-sales services depends on the integration of several elements, including skilled human resources, standardized training, effective service processes, technological infrastructure, performance evaluation, managerial coordination, and customer satisfaction mechanisms. Research on after-sales service efficiency in Iranian automotive companies has shown that structural, organizational, and managerial factors play a significant role in determining service performance (4). Similarly, attempts to design world-class after-sales service models in Iranian industrial contexts demonstrate that after-sales service development cannot be reduced to isolated operational improvements; rather, it requires a systemic understanding of organizational processes, service standards, customer expectations, and human-resource capabilities (5).

One of the central requirements for improving after-sales service quality is the development of an appropriate curriculum model for training the human resources involved in this field. A curriculum model in this context refers to an organized framework that defines educational goals, learning content, instructional strategies, practical competencies, technological requirements, assessment mechanisms, and expected professional outcomes. Unlike general training programs, a curriculum for automotive after-sales services must respond to the realities of a dynamic industry, where technical knowledge, diagnostic skills, customer interaction, service ethics, digital systems, organizational procedures, and quality assurance must be learned in an integrated way. The need for curriculum renewal has been emphasized in contemporary sales and service education, particularly because modern business environments increasingly require alignment between educational content and workplace conditions (6, 7). Therefore, the design of an after-sales service curriculum must be grounded in the actual requirements of the service environment and must reflect the competencies expected from employees, managers, trainers, and technical personnel.

The importance of industry-aligned curriculum design has also been emphasized in vocational and professional education. Studies on automotive technology programs indicate that educational programs must be complemented by industry standards to ensure that graduates and trainees acquire competencies relevant to real workplace expectations (8). In vocational education, the connection between learning environments and production or service processes is a key factor in improving practical learning and institutional quality (9). In the same direction, education and training programs designed for sales-force competency development show that professional learning should be evaluated in relation to contextual needs, organizational inputs, and actual competency gaps (10). These findings are highly relevant to after-sales services in the automotive industry, because the success of service networks depends not only on technical expertise but also on the systematic development of competencies through curricula that reflect the needs of companies, employees, and customers.

The transformation of business environments under the influence of digitalization has further increased the need to rethink curriculum models for service-related professions. Digital technologies, data analytics, artificial intelligence, enterprise

resource planning systems, and online platforms have changed the nature of work in many sectors. In marketing and sales education, the digital economy has created new expectations for talent cultivation, curriculum design, and school-enterprise collaboration (11, 12). Digital economic development has also affected the training of business English and professional communication talents, showing that educational programs must be responsive to regional and technological changes (13, 14). In the automotive after-sales context, digitalization affects diagnostic systems, customer relationship management, spare-parts forecasting, online service scheduling, warranty processing, training delivery, and service quality monitoring. Therefore, a curriculum model for after-sales services must not only include traditional technical competencies but also address digital literacy, data-based decision-making, technology-enhanced service delivery, and the use of digital tools in training and evaluation.

The relevance of digital transformation becomes clearer when considering the role of data-driven methods in after-sales services. For example, machine learning has been applied to spare-parts sales forecasting in after-sales service contexts, demonstrating how data analytics can improve planning and decision-making in service systems (15). Digital tools have also been integrated into entrepreneurship training, accounting education, ERP education, and big-data-related curricula, indicating that professional education increasingly requires experiential, system-based, and technology-supported learning (16-19). These developments suggest that after-sales service curricula should incorporate technological competencies that enable employees to understand and use service information systems, diagnostic platforms, inventory data, customer feedback systems, and digital communication channels. In the absence of such competencies, service networks may fail to respond to the growing technological complexity of modern vehicles and customer-service expectations.

At the same time, the curriculum for after-sales services cannot be limited to technical and digital skills. Contemporary professional education increasingly emphasizes entrepreneurship, innovation, interdisciplinary skills, and adaptive learning. Entrepreneurship education studies show that students and trainees require interdisciplinary competencies, problem-solving abilities, creativity, and opportunity recognition skills in order to respond to changing labor-market conditions (20, 21). The development of digitalpreneurship curricula also highlights the importance of designing educational programs that strengthen entrepreneurship skills and enable learners to work effectively in digital business environments (22). Although after-sales services are often viewed as technical or operational activities, they also require entrepreneurial and intrapreneurial capabilities, because service managers and employees must identify customer problems, improve service processes, propose innovations, and create value within organizational systems (23). Consequently, a curriculum model for after-sales services should cultivate both operational competence and innovative thinking.

The changing nature of professional competencies is also evident in research on artificial intelligence, future jobs, and technology-based education. The impact of artificial intelligence on education for future jobs shows that curricula must prepare learners for emerging occupational roles and technological transformations (24). Similarly, innovative technologies for enhancing learning quality in higher education emphasize the need for educational systems to use modern methods to improve the quality, relevance, and effectiveness of learning (25). In the field of after-sales services, this means that curriculum designers must anticipate future service needs rather than merely reproduce existing routines. Electric vehicles, connected vehicles, intelligent diagnostics, online customer-service systems, and data-driven maintenance will require new forms of learning and new competency frameworks. Therefore, the identification of curriculum dimensions and components must be future-oriented while remaining grounded in the current realities of Iran's automotive service network.

Human-resource development is another essential dimension of after-sales service curriculum design. Professional education does not occur in isolation from organizational structures, workplace culture, managerial support, and social conditions. Studies on knowledge management and human resource development show that learning initiatives can help reduce

inequality and improve local development when they are designed according to contextual needs (26). Community-based development perspectives also suggest that education and professional capacity-building should be linked to local economic and social ecosystems (27). In after-sales services, human-resource development includes not only the training of technicians but also the development of trainers, service advisors, customer-relations personnel, supervisors, network managers, and evaluators. A curriculum model should therefore define the learning requirements of different roles within the service system and clarify how each role contributes to overall service quality.

Business strategy research also reinforces the necessity of aligning education, service capability, and organizational performance. Strategic formulation for business revenue growth highlights the importance of internal capability development and market responsiveness (28). In the digital and green economy era, marketing management programs are expected to adapt their educational orientation to new economic conditions and sustainability-related expectations (29). Studies on small and medium-sized enterprises in cross-border electronic commerce further show that business development depends on the ability to address operational, technological, and market-related challenges through adaptive strategies (30). These perspectives are relevant to automotive after-sales services because service quality is not merely a technical issue; it is connected to revenue generation, customer retention, reputation management, market competition, and organizational sustainability. Therefore, curriculum design should be considered a strategic tool for improving after-sales service capability.

Another important point is that contemporary curriculum development increasingly requires collaboration between educational institutions and industry. School-enterprise training models demonstrate that cooperation between educational and professional organizations can help bridge the gap between theoretical knowledge and workplace skills (12). Experiential learning programs also show that structured implementation strategies are necessary for transforming educational intentions into effective learning outcomes (31). In the automotive industry, such collaboration is particularly important because service technologies, diagnostic procedures, customer-service standards, and manufacturer requirements change continuously. A curriculum designed without the participation of industry experts may become disconnected from workplace realities, while a training system designed without educational principles may remain fragmented and unsystematic. Thus, the identification of curriculum dimensions must be based on the perspectives of knowledgeable experts who understand both the educational and operational aspects of after-sales services.

The growing body of research on professional, vocational, entrepreneurial, and digital education indicates that curriculum models must be multidimensional, context-sensitive, competency-based, and responsive to technological and market change. Studies on start-up education during the COVID-19 period reveal that educational systems must respond flexibly to uncertain and changing environments (32). Research on early education enterprise marketing strategies also shows that educational service organizations must continuously revise their strategies in response to customer needs and competitive conditions (33). Although these studies are located in different sectors, they collectively emphasize a shared principle: educational and training programs must be designed based on the real needs of the target field. For Iran's automotive after-sales service industry, this principle implies that the curriculum model should emerge from the practical experiences, professional interpretations, and expert knowledge of those who are directly involved in the service system.

Despite the importance of after-sales services in the automotive industry, there remains a need for a coherent qualitative understanding of the dimensions and components that should shape a specialized curriculum model for this field in Iran. Existing studies have examined after-sales service quality, customer retention, customer loyalty, service efficiency, and world-class service models, but the curriculum foundations required for preparing competent human resources in automotive after-sales services have received less direct attention (1-5). Moreover, while international studies on vocational education, digital education, sales education, entrepreneurship education, and experiential learning offer valuable insights, these insights must be

interpreted in relation to the specific organizational, technological, and professional conditions of Iran's automotive after-sales service industry (6-8, 22). Therefore, a qualitative inquiry grounded in expert perspectives can help identify the essential categories, relationships, and conceptual components needed for designing an effective curriculum model.

Accordingly, the aim of the present study was to identify the dimensions and components of the curriculum model for after-sales services in Iran's automotive industry.

Methods and Materials

This study was conducted using a qualitative research design with a grounded theory approach. The purpose of selecting this approach was to identify, conceptualize, and organize the dimensions and components of a curriculum model for after-sales services in Iran's automotive industry based on the lived experiences, professional knowledge, and expert interpretations of individuals directly familiar with the field. Since the objective of the study was exploratory and model-generating, the qualitative grounded theory method provided an appropriate framework for discovering the underlying categories, relationships, and conceptual structure of the phenomenon under investigation. The study population consisted of experts and key informants in the field of after-sales services in Iran's automotive industry, as well as academic experts in curriculum studies and curriculum planning. Participants included senior managers, chief executive officers or deputy chief executive officers active in automotive after-sales services, training managers, technical experts, experienced technical personnel, and university faculty members familiar with curriculum design and planning.

Participants were selected through purposive sampling, and the selection process continued through snowball sampling as knowledgeable participants introduced other experts who could provide rich and relevant information. The main criterion for inclusion was having sufficient professional, managerial, technical, educational, or academic experience related to after-sales services in the automotive industry or curriculum planning. The sampling process continued until theoretical saturation was achieved. In total, 18 experts participated in the study. Theoretical saturation was reached in the sixteenth interview, when no new category, concept, or substantial insight emerged from the data; however, two additional interviews were conducted to ensure the stability and completeness of the extracted categories. The interviews were conducted face to face between July 19, 2021, and May 22, 2022. Before each interview, the researcher contacted the participants, introduced the study, explained the research purpose, clarified the interview procedure, assured the participants of confidentiality, and explained the reason for their selection. After receiving their consent to participate, the time and place of each interview were determined according to the participants' preferences. To allow participants sufficient time for reflection, the general interview guide and thematic framework of the research topic were provided to them before the interview.

The main data collection tool in this study was an exploratory semi-structured interview. This type of interview was selected because it allowed the researcher to guide the conversation around the main research topic while also giving participants sufficient freedom to express their experiences, interpretations, and professional viewpoints in depth. The interview guide was developed by the researcher after reviewing the theoretical literature, examining the research background, and clarifying the qualitative purpose of the study. The initial interview questions focused on the dimensions, components, requirements, challenges, educational needs, managerial conditions, technological considerations, human resource factors, evaluation processes, and customer-oriented aspects of a curriculum model for after-sales services in Iran's automotive industry. The interview questions were broad and open-ended so that participants could describe the phenomenon from their own professional perspective and introduce issues that might not have been anticipated by the researcher.

To ensure the appropriateness and content validity of the interview guide, the questions were reviewed by supervisors, advisors, and informed experts in the relevant field. Based on their comments, the wording, scope, and sequence of the questions

were revised, and the final version of the semi-structured interview guide was prepared. During the interviews, the researcher attempted to create a calm and flexible atmosphere so that participants could freely present their viewpoints, while the general structure of the interview ensured that all major areas of the research problem were addressed. Depending on the participant's responses, follow-up and probing questions were asked to clarify meanings, explore deeper experiences, and obtain richer descriptions. Each interview lasted approximately 40 to 60 minutes. With the consent of the participants, the interviews were audio-recorded. Immediately after each interview, the recorded content was transcribed verbatim using the participants' own wording and expressions. The transcripts were then reviewed several times to help the researcher achieve a deeper understanding of the data before the formal coding process began.

The credibility and trustworthiness of the qualitative data were supported through Lincoln and Guba's evaluative criteria, including credibility, transferability, dependability, and confirmability. Credibility was strengthened through prolonged engagement with the research field, careful review of interview transcripts, member checking, and the confirmation of extracted meanings by participants. In addition, maximum variation among participants in terms of professional role and expertise helped enrich the data and increase the depth of the findings. Transferability was supported by selecting information-rich participants and providing detailed descriptions of the research context, participants' experiences, and extracted categories. Dependability was enhanced through systematic documentation of the research process, careful recording of analytic decisions, and repeated review of the interview data. Confirmability was ensured by maintaining researcher neutrality, documenting the coding process, comparing codes and categories, and obtaining expert review of the extracted concepts and categories by knowledgeable academic and professional specialists.

Data analysis was carried out using the grounded theory coding procedure based on open coding, axial coding, and selective coding. The analysis began immediately after the first interview and continued simultaneously with data collection. Each transcript was read several times to obtain a holistic understanding of the participant's statements. In the open coding stage, the interview texts were broken down into meaningful units, and initial codes were assigned to words, sentences, and paragraphs that contained important meanings related to the research question. These codes represented the first level of conceptualization and were extracted both manually and with the assistance of MAXQDA 10 software. The interview transcripts were imported into the software, and the open coding process was conducted line by line. At the end of this stage, the initial codes were reviewed, organized, and exported for further comparison and categorization.

In the axial coding stage, the open codes were compared based on conceptual similarity, semantic closeness, and shared characteristics. Similar codes were grouped together, and each group was labeled with a title that reflected its common meaning. Through continuous comparison, repeated movement between the data and emerging categories, and constant merging and refinement of similar concepts, the researcher gradually organized the codes into subcategories and main categories. At this stage, the relationships among categories were examined, and the researcher identified how the extracted concepts were connected to one another within the phenomenon of curriculum development for after-sales services in the automotive industry. The constant comparative method helped distinguish similarities and differences among concepts and enabled the researcher to move from descriptive codes toward more abstract and theoretically meaningful categories.

In the selective coding stage, the main categories were integrated around a central category, and the relationships among the categories were refined to form a coherent grounded model. The researcher examined the extracted categories in relation to the overall research aim and developed a theoretical narrative explaining the dimensions and components of the curriculum model for after-sales services in Iran's automotive industry. During this stage, the categories were reviewed repeatedly to ensure that they were conceptually clear, internally consistent, and adequately supported by the interview data. The final model was developed as a paradigmatic structure based on the relationships among the main categories, subcategories, and conceptual

components derived from the participants' statements. Coding continued until theoretical saturation was achieved, meaning that no new concepts, categories, or relationships emerged from the raw data. To enhance the reliability of the coding process, selected interview transcripts and extracted categories were reviewed by academic experts and specialists familiar with after-sales services and curriculum studies, and their feedback was used to refine and confirm the final categorization.

Findings and Results

The qualitative data were collected through semi-structured interviews with 18 experts and key informants in the field of automotive after-sales services and curriculum-related professional training in Iran. The participants included senior managers, chief executive officers, after-sales service managers, training managers, technical instructors, inspection and quality specialists, customer satisfaction supervisors, and senior experts working in automotive companies, service networks, technical training institutions, and related professional organizations. Of the 18 participants, 16 were male and 2 were female. The participants' ages ranged from 34 to 70 years, with an approximate mean age of 47.22 years. Their related work experience ranged from 10 to 39 years, with an approximate mean of 21.56 years. In terms of educational background, the participants had academic qualifications from bachelor's degree to doctoral and professional doctoral levels, and their fields of study included public administration, technology management, industrial management, automotive technology engineering, mechanics, industrial engineering, educational management, human resource management, executive management, information technology, operations research, and management engineering. This composition indicates that the interview sample included individuals with extensive managerial, technical, educational, and organizational experience relevant to the development of a curriculum model for after-sales services in Iran's automotive industry.

Table 1. Demographic Characteristics of Interview Participants

No.	Participant Code	Position	Age (Years)	Gender	Academic Degree	Field of Study	Related Work Experience (Years)
1	IN-MD-01-001	Secretary of the Trade Association of Automotive After-Sales Service Companies	70	Male	PhD	Public Administration	38
2	IN-SP-01-001	Inspection Services Manager at Iran Standard and Quality Inspection Company	38	Male	Master's Degree	Technology Management	18
3	IN-SP-02-002	Head of Service Improvement Department at Iran Standard and Quality Inspection Company	41	Male	PhD	Industrial Management, Systems Orientation	22
4	IN-SP-03-003	Senior Officer, Technical Course Instructor at ISACO, and Owner and Operator of Two Independent Repair Shops	53	Male	Bachelor's Degree	Automotive Technology Engineering	32
5	IN-MD-02-002	Chief Executive Officer of Mayan Diesel Company	54	Male	Master's Degree	Mechanics	24
6	IN-MD-03-003	Former Chief Executive Officer of Top Service Company, Consultant, and Instructor of Training Courses Related to Automotive After-Sales Services	61	Male	Professional Doctorate	Industrial Engineering	39
7	IN-SM-01-001	After-Sales Service Network Manager at Govah Company and Technical Course Instructor	50	Male	Master's Degree	Educational Management	24
8	IN-SP-04-004	Training Manager at Saipa Yadak Company	47	Male	Bachelor's Degree	Automotive Mechanics	21
9	IN-SP-05-005	Head of Training Development at Saipa Yadak Company	42	Female	PhD	Human Resource Management	16
10	IN-MD-04-004	Development Manager at Bahman Motor Company	43	Male	Master's Degree	Executive Management, Information Technology	16

11	IN-SP-06-006	Senior Training Expert at Persia Khodro Company	45	Male	Master's Degree	Industrial Management, Operations Research	20
12	IN-SP-07-007	Supervisor of Customer Satisfaction and Service Unit at Renault Pars Company	50	Male	Master's Degree	Executive Management, Business Orientation	17
13	IN-SP-08-008	Head of Agency Network at Irtoya Company	34	Male	Master's Degree	Executive Management	12
14	IN-SP-09-009	Director of Ferdowsi Technical and Vocational Training Institute	61	Male	Bachelor's Degree	Mechanics	21
15	IN-SP-10-010	Advisor to the Chief Executive Officer of Morattab Khodro and Seif Khodro Companies	37	Male	Master's Degree	Management and Engineering	10
16	IN-SP-11-011	After-Sales Service Manager at Agency 202 Asan Kar, Hyundai	40	Male	PhD	Executive Management	19
17	IN-SP-12-012	Senior Expert in the Training Unit of the Sales and After-Sales Service Organization of Bahman Group	37	Female	Master's Degree	Information Technology Management	13
18	IN-MD-05-005	Chief Executive Officer of Shahab Yar Company	47	Male	Master's Degree	Mechanics	26

As shown in Table 1, the participants represented a wide range of professional roles within the automotive after-sales service ecosystem. The inclusion of chief executive officers, development managers, service network managers, training managers, technical experts, inspection managers, and customer satisfaction supervisors provided a broad and multi-perspective understanding of the curriculum requirements in this field. This diversity was important because the curriculum model under investigation was not limited to technical training alone, but also involved managerial, organizational, customer-oriented, technological, evaluative, and human-resource-related dimensions.

The age distribution of the participants shows that the interviewees were generally mature and experienced professionals. The youngest participant was 34 years old, and the oldest participant was 70 years old. Most participants were in the middle and senior stages of their professional careers, which strengthened the richness of the qualitative data. Their age and occupational maturity enabled them to discuss the historical development, current challenges, and future needs of after-sales services in Iran's automotive industry from an informed and experience-based perspective.

The participants also had substantial professional experience in areas directly related to the research topic. Their related work experience ranged from 10 to 39 years, indicating that all participants had long-term exposure to the field. Several participants had more than two decades of professional experience, and some had more than three decades of experience in management, training, inspection, technical services, or after-sales service systems. This level of experience increased the depth of the interviews and allowed the researcher to extract concepts grounded in practical realities rather than merely theoretical assumptions.

In terms of educational qualifications, the participants had strong academic backgrounds. Four participants held PhD degrees, one participant held a professional doctorate, ten participants held master's degrees, and three participants held bachelor's degrees. This educational composition indicates that the interview sample included both highly educated academic and managerial experts and technically experienced practitioners. The combination of advanced academic qualifications and practical field experience was particularly valuable for identifying the dimensions and components of a curriculum model, because such a model requires both theoretical coherence and practical applicability.

The fields of study of the participants were also relevant to the interdisciplinary nature of the research topic. The participants' academic backgrounds covered public administration, industrial management, technology management, executive management, educational management, human resource management, information technology management, operations research, mechanics, automotive mechanics, automotive technology engineering, industrial engineering, and management

engineering. This diversity reflects the multidimensional nature of after-sales service curriculum design in the automotive industry, where technical competence, service quality, organizational management, customer satisfaction, technology use, and educational planning must be considered simultaneously.

Overall, the demographic and professional characteristics of the participants demonstrate that the interview sample was appropriate for the qualitative purpose of the study. The participants had adequate expertise, relevant work experience, organizational familiarity, technical knowledge, and educational insight to contribute meaningfully to the identification of the dimensions and components of the curriculum model for after-sales services in Iran's automotive industry.

Discussion and Conclusion

The findings of the present qualitative study showed that the curriculum model for after-sales services in Iran's automotive industry is a multidimensional construct shaped by six major categories: efficient and effective management, skilled and trained human resources, the use of modern technologies, training development, evaluation, and customer satisfaction. These categories indicate that after-sales service curriculum design cannot be understood merely as the preparation of technical training content for repair and maintenance personnel. Rather, it must be viewed as an integrated educational, organizational, technological, and customer-oriented system. The participants' views revealed that an effective curriculum for this field should simultaneously address managerial coordination, professional competency development, technological adaptation, structured training processes, continuous assessment, and responsiveness to customer expectations. This result is consistent with studies that consider after-sales service a strategic function affecting customer retention, perceived value, loyalty, and service performance (1-3). Therefore, the central contribution of the present study is that it places curriculum design at the core of after-sales service improvement and demonstrates that service quality in the automotive industry depends significantly on how human resources are educated, trained, evaluated, and supported.

One of the main findings of the study was the importance of efficient and effective management as a foundational dimension of the curriculum model. From the participants' perspective, after-sales service training should be linked to managerial planning, service network governance, coordination among organizational units, resource allocation, quality standards, and strategic decision-making. This finding aligns with research showing that after-sales service efficiency is affected by structural and managerial factors in automotive companies (4). It is also consistent with the view that world-class after-sales service models require a systemic approach in which organizational processes, managerial mechanisms, service standards, and stakeholder expectations are considered together (5). In the Iranian automotive context, where after-sales services involve manufacturers, dealerships, inspection organizations, technical training centers, and customer-service units, curriculum design should prepare learners not only for technical duties but also for understanding organizational procedures, service responsibilities, process management, and interdepartmental coordination.

The second major finding concerned the role of skilled and trained human resources. The participants emphasized that the success of after-sales services depends on competent personnel who possess technical expertise, diagnostic capability, customer-communication skills, problem-solving ability, and familiarity with service standards. This finding is supported by studies in vocational and professional education showing that industry-related training must be aligned with workplace standards and occupational competencies (8, 9). In the same way, research on sales-force competency development confirms that education and training programs should be designed according to the actual needs of the professional field and the competency gaps of personnel (10). In the present study, the emphasis on human resources suggests that an after-sales service curriculum should include differentiated learning paths for technicians, service advisors, customer-relations staff, trainers,

supervisors, and managers. Such differentiation can help ensure that each occupational group develops the knowledge and skills required for its specific role within the service system.

Another important result was the identification of modern technologies as a core component of the curriculum model. Participants' emphasis on technology reflects the increasing dependence of after-sales services on diagnostic systems, digital service records, customer relationship management platforms, online communication systems, spare-parts databases, and data-driven decision-making. This result is strongly consistent with studies on digital transformation in business and education, which show that professional curricula must adapt to technological change and the demands of the digital economy (11, 13, 14). In after-sales service systems, the use of machine learning for spare-parts sales forecasting indicates how data analytics can support planning and operational efficiency (15). Similarly, studies on ERP education, SAP ERP training, big data cases, and information mining technology show that experiential and technology-based learning can improve professional readiness in complex work environments (16-19). Therefore, the present finding suggests that technological literacy should not be treated as an optional addition to the curriculum, but as a central competency area in automotive after-sales service education.

The study also showed that training development is a central dimension of the proposed curriculum model. Participants viewed training as a continuous and structured process that should be designed according to occupational needs, service standards, technological changes, and customer expectations. This finding is aligned with research emphasizing the need to refresh sales and professional curricula in response to modern market environments (6, 7). It is also consistent with studies on school-enterprise cooperation and experiential learning, which suggest that effective professional education requires strong interaction between educational design and workplace practice (12, 31). In the context of automotive after-sales services, training development should include needs assessment, competency-based content design, practical learning opportunities, simulation-based instruction, field-based learning, trainer development, and continuous updating of educational materials. The findings therefore highlight that curriculum design should be dynamic rather than fixed; it must evolve as vehicle technologies, customer demands, service standards, and organizational strategies change.

Evaluation emerged as another major category in the findings. Participants emphasized that the curriculum model should include mechanisms for evaluating learning outcomes, service performance, technical competence, customer-service behavior, and the effectiveness of training programs. This result is important because evaluation connects curriculum design to accountability and quality improvement. In professional education, evaluation is essential for ensuring that learning programs produce measurable improvements in knowledge, skill, and workplace performance. Studies on experiential learning, vocational education quality, and competency development support the need for systematic evaluation of educational programs and their practical outcomes (9, 10, 31). In the after-sales service context, evaluation should not be limited to final tests or course completion certificates. Instead, it should include practical assessment, performance observation, customer feedback, service-quality indicators, error reduction, repair accuracy, adherence to standards, and post-training monitoring. Such a comprehensive evaluation system can help ensure that the curriculum contributes directly to service improvement.

Customer satisfaction was also identified as a key dimension of the curriculum model. This finding indicates that after-sales service education must be designed with the customer experience in mind. Technical repair quality is essential, but it is not sufficient if customers experience poor communication, delays, lack of transparency, weak follow-up, or inadequate responsiveness. Previous studies confirm that after-sales service quality affects customer satisfaction, loyalty, repurchase intention, word-of-mouth advertising, and brand switching behavior (1-3). Therefore, the curriculum should include customer communication, complaint handling, service ethics, trust-building, customer education, and satisfaction management. This result expands the meaning of after-sales service curriculum by showing that employees must be trained not only to repair vehicles but also to manage the customer relationship throughout the service encounter.

The findings also suggest that the curriculum model should prepare the after-sales service system for innovation, adaptability, and future-oriented professional development. This interpretation is supported by studies on entrepreneurship education, digitalpreneurship, intrapreneurship, and interdisciplinary skills, which emphasize that modern curricula should cultivate creativity, adaptability, opportunity recognition, and innovation within organizations (20-23). In the automotive after-sales service industry, innovation may appear in the form of improved service processes, digital customer platforms, predictive maintenance, new training methods, enhanced diagnostic procedures, and better coordination between service centers and manufacturers. Research on artificial intelligence and future jobs further supports the need for curricula that prepare learners for emerging technologies and transformed occupational roles (24). Accordingly, the curriculum model identified in this study should be understood as a framework for both current competency development and future workforce readiness.

The strategic dimension of the findings is also noteworthy. The participants' emphasis on management, technology, training, evaluation, and customer satisfaction shows that curriculum development is directly connected to organizational performance and market competitiveness. Studies on business strategy formulation, marketing management in the digital and green economy, and the development challenges of small and medium-sized enterprises show that organizational success depends on strategic adaptation, capability development, and responsiveness to changing market conditions (28-30). In the automotive industry, after-sales services influence revenue, brand reputation, customer retention, and competitive positioning. Therefore, investing in a specialized curriculum for after-sales service personnel should be regarded not only as an educational activity but also as a strategic organizational intervention.

The findings further indicate that the proposed curriculum model must be context-sensitive. Although international studies provide useful insights into vocational education, sales education, technology-based learning, entrepreneurship education, and professional training, the after-sales service curriculum in Iran's automotive industry must be adapted to local organizational structures, service networks, technological capacities, customer expectations, and workforce characteristics. Studies on community-based development and human-resource development show that educational models become more effective when they are designed according to local needs and contextual conditions (26, 27). This supports the grounded theory approach used in the present study, because the model was developed from expert perspectives within the Iranian automotive after-sales service field. Furthermore, studies on educational quality and start-up education in changing environments indicate that curriculum models should remain flexible and responsive to uncertainty (25, 32). This is particularly relevant for automotive after-sales services, where technological changes, supply-chain issues, customer demands, and market pressures continuously reshape service requirements.

Overall, the results of this study are consistent with previous research emphasizing the strategic role of after-sales services, the necessity of competency-based professional training, the importance of technology integration, and the need for customer-oriented service education. The six extracted dimensions provide a comprehensive structure for designing a curriculum model that can respond to the practical needs of Iran's automotive after-sales service industry. By integrating management, human resources, technology, training development, evaluation, and customer satisfaction, the proposed model offers a grounded framework for improving both educational processes and service outcomes. The findings imply that any attempt to enhance after-sales service quality in the automotive industry should begin with a systematic reconsideration of how personnel are trained, how competencies are defined, how learning is evaluated, and how educational programs are connected to customer and organizational needs.

This study was limited to a qualitative exploration of expert perspectives in the field of after-sales services in Iran's automotive industry. Although the participants were selected purposefully and had substantial experience and knowledge, the findings reflect the views of a specific group of experts and may not capture all possible perspectives across the entire

automotive service ecosystem. The study also relied on interview data, and although several trustworthiness strategies were used, participants' responses may have been influenced by their organizational position, personal experience, or professional priorities. In addition, because the study focused on the Iranian automotive industry, the transferability of the findings to other countries or other industrial sectors should be considered with caution.

Future studies can examine the proposed curriculum model in different automotive companies, dealership networks, technical training centers, and independent repair-service environments to compare how the identified dimensions appear across different organizational contexts. Further qualitative research can also explore the perspectives of customers, trainees, trainers, and frontline service employees to complement the expert-based findings of this study. In addition, future studies may develop detailed competency frameworks for each occupational role in after-sales services, including technicians, service advisors, customer-relations staff, training managers, and service-network supervisors. Longitudinal research can also investigate how curriculum implementation affects service quality, employee performance, and customer satisfaction over time.

Automotive companies and after-sales service organizations should use the findings of this study to design integrated, competency-based, and continuously updated training programs for their service networks. Training content should not be limited to technical repair skills; it should also include customer communication, service ethics, digital systems, quality evaluation, managerial coordination, and problem-solving in real service situations. Organizations should establish regular needs-assessment processes, develop practical and workplace-based learning modules, train professional instructors, and evaluate the impact of training on actual service performance. By connecting curriculum design with organizational strategy and customer satisfaction, after-sales service providers can improve workforce capability, service consistency, and long-term customer trust.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adhered in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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