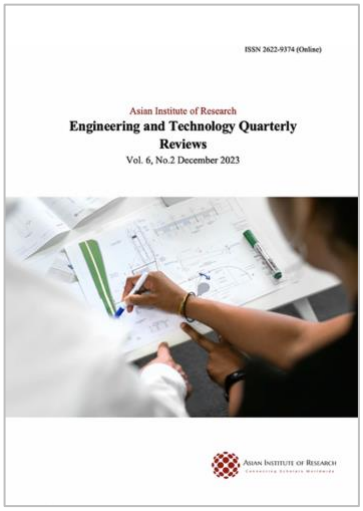

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Evaluation of the Short-Term Summer Internship Program: A Process-Driven Study at OpenZeka

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Abstract
This study evaluated the effectiveness of a summer internship program at OpenZeka, an AI company, in Ankara, in 2021. For this study, a process-oriented qualitative research technique was used. To ensure validity, details such as participant and colleague confirmation and flexibility in the research process were given attention. In order to guarantee the dependability of the research, the researcher's location was specified, a conceptual framework was developed, multiple data were gathered from participants in the social setting where the application was implemented, and the methods of analysis utilized were thoroughly explained. After conducting reviews and analysis, we evaluated a summer internship program and discussed the results from different perspectives. Our recommendations section offers various suggestions to interns, implementing companies, and researchers on how to ensure the success of a short-term internship program and how it can be improved.

Keywords: OpenZeka, Summer Internship, Process-Driven Study

1. Introduction

This section provides general information about the internship period, including concepts such as internships, internship programs, evaluations, program evaluations, and action research. The chapter concludes by discussing the various approaches found in literature on curriculum evaluations and emphasizing the importance of this research.

The OpenZeka Summer Internship Program for 2021 was scheduled in January and February and was later announced on the company's website and social media channels in March. Interested individuals were able to apply by filling out an application form on the company's website, after giving permission for their personal data to be collected. The program received over 200 applications from different universities. Engineers who specialize in their respective fields conducted a preliminary review of the submitted CVs, and all candidates were provided with constructive feedback. Interviews, whether oral, written, face-to-face or video, were conducted with the shortlisted applicants. Eventually, only 14 applicants were selected for the program. It should be noted that two of the selected applicants were unable to participate in the internship scheduled for April, citing various reasons. In May, a group of 12 individuals began the internship program. The length of each

trainee's internship ranged from 20 to 40 days based on their preference and internship rights. The program ran on working days from May 31st to September 14th. Start and end dates for each candidate were determined individually, with the entire program taking 14 weeks to complete as required by the company. Please note that public holidays are not counted towards the duration of the internship program. Any posts related to the internship process on our company's social media channels and website have been approved by our interns in accordance with Annex-1 of Law No. 6698 on the Protection of Personal Data. During the internship, we worked in the physical office of the company and completed occupational health and safety training at the beginning of the program (see Annex_2). The names and signatures on Annex_1 and Annex_2 are kept confidential according to the General Data Protection Regulation. The internship coincided with the global COVID-19 pandemic, so the company took necessary health precautions. We were required to complete daily HES (Hayat Eve Sığar) health checks, and thankfully, there were no COVID-19 cases during the internship.

It is important to examine the frequently used concepts in this research, including internship, intern, evaluation, and program evaluation. Internship, which originates from the French word "stage," has been defined in various ways in literature. There are different definitions of the term "practical learning period". According to Demir & Demir (2014), it can be understood as the period of applying theoretical knowledge into practice. Meanwhile, Alp (2020, p.16) defines it as the time spent by an individual working in a company to enhance their professional knowledge. Izadpanah, Elinç, Abay, & Küçükköseler (2020) explain it as an educational process that aims to increase professional awareness through practical application of the theoretical and applied knowledge learned during students' education. Tan & Umemoto (2021) and Pan, Guan, Wu, Han, Zhu, Fu, & Yu (2018) view it as a student's real-life working experience, while Tan & Umemoto (2021) also describe it as a global platform for training future engineers. The term "intern" refers to an individual who plays a role in the internship process and is impacted by it. They are typically someone who engages in activities to apply their education in a profession or art field and gain practical experience. This definition was provided by Kozak in 2014. An intern is someone who completes an internship according to specific guidelines. Evaluation refers to the process of assessing the program's activities, attributes, and outcomes. It involves gathering information systematically to enhance the program's efficacy and assess whether the objectives have been achieved. This is based on works by Ertürk (1998), Hamblin (1970), Patton (1997), and Eviren (2017). An evaluation process is responsible for testing whether the objectives and target behaviors outlined in the curricula are successfully met, as planned (Yaşar, 2014). Evaluation is defined as the process of making a judgment on the process or results of a situation or program, assessing its significance based on specific criteria, obtaining feedback on its effects, and assigning values accordingly to improve the training (Eviren, 2017). According to Stufflebeam (2000), the main purpose of evaluation is to improve rather than to prove. Therefore, the primary goal of program evaluation is to continuously enhance the program to a better level and ensure its renewal based on changing situations and conditions. The criticisms that emerged from the face-to-face interviews conducted in this research have contributed to improving the program. Evaluation, which involves measuring the results of a training program based on specific criteria to determine its effects and benefits, is necessary to identify and correct any deficiencies or defects in the program (Eviren, 2017, p. 58).

Different types of program evaluation have been discussed in the literature, with curriculum evaluation typically falling under three categories: diagnostic, formative, and summative evaluation (Demirel, 2007; pp.177-178). During the internship program, interim measurement and monitoring were conducted to identify needs, and the program was evaluated as a whole. Hence, this study employed all three methods of evaluation. Additionally, various models and approaches to curriculum evaluation have been suggested in the literature review, such as Tyler's Goal-Oriented Model, Metfessel-Michael Evaluation Model, Provus's Discrepancy Evaluation model, Stake's Conformity-Probability Model, Stufflebeam's Context, Input-Process and Product Model and Stufflebeam's Total Evaluation Model, Eisner's Educational Criticism Evaluation Model, Stake's (1983) Responsive Program Evaluation Model, and Demirel's Analytical Program Evaluation Model (Demirel, 2007; pp.179-187). In this study, the aim was to understand the overall evaluation and the differences between the program's objectives and results. The evaluation approach used in the research was the Provus Discrepancy Evaluation Model, developed by Malcolm Provus for educational program evaluation and improvement. This model has a pragmatic/utilitarian perspective and is the first of its kind. Its strongest aspects include emphasizing program definition, analyzing definitions, ensuring information flow between participants and program processes and results, and effectively using data to provide links. (Eviren, 2017, pp.63-64).

The problem statement of this research is to determine whether the OpenZeka 2021 summer internship program achieved its goals and whether a more efficient program can be proposed. The research aims to provide insights into possible problems and solutions that may arise in a short-term internship program. Additionally, it aims to thoroughly evaluate an internship program, create an original program, offer new experiences in an office setting to aspiring engineers interested in artificial intelligence and embedded technologies, identify potential problems during the implementation process of a real internship, develop solutions to those problems, and present a unique engineering internship model. This research is considered significant in this regard. Therefore, the general problem situation is the efficiency of the internship program, and the research questions related to the problem have been determined as follows.

1) What is the scope of the action plan for the OpenZeka 2021 Summer Internship program?
2) What are the thought of the interns on the OpenZeka 2021 summer internship program?
3) What are the thoughts of the interns regarding their evaluation of the company?
4) What can be said about the technical performance of the interns?
5) What can be said about the problems encountered during the operation of the action plan prepared within the scope of the internship program?
6) What can be said about eliminating the problems experienced during the implementation of the internship program?
7) What can be said about the new action plan?

2. Methodology

This study aims to evaluate the OpenZeka 2021 Summer Internship Program, using the action research technique. To assess the program as a whole, it is necessary to scrutinize the issues from the planning phase until the program's completion. The researcher, who is also the training manager, actively participated in the internship program from start to finish. In qualitative research, the "transferability" feature is the equivalent of the "generalizability" feature in quantitative research (Yıldırım & Şimşek, 2011, p.303).To enhance the applicability of qualitative research, it strives to impart some insights and experiences to readers towards the end of the study instead of drawing conclusions that are universally valid. In qualitative research, it is essential that the researcher observes the phenomenon with as little bias as possible and demonstrates flexibility, which are crucial factors for achieving validity (Kirk & Miller, 1986). As part of this study, we conducted interviews with potential interns from different engineering departments at various universities. We also received support from researchers on how to perform unbiased evaluations. To ensure accuracy, we used a variety of research techniques including observation, descriptive analysis, document analysis, and content analysis. This allowed us to gather diverse perspectives from both participants and methods.

To ensure the validity of our qualitative research, we collected information over an extended period of time in natural settings, confirmed our findings by returning to the research environment, collected additional information when possible, and used different analysis strategies. As the researcher, we were present during the entire process as both an educational administrator and coordinator. To ensure the reliability of our study, we first established a framework for evaluating internships, introduced the social environment and participants, and explained our data collection and analysis methods in detail.

The process of action research is structured to focus on problem-solving and is continuous in nature. It involves identifying the problem, collecting data, analyzing it, determining an action plan, implementing the plan, and deciding on an alternative or new course of action. (Yıldırım & Şimşek, 2011, pp. 335-336). According to Mills' (2000) classification, action research can be divided into two types: applied action research and participatory action research. The former is focused on addressing educational problems, while the latter aims to enhance the learning outcomes of individuals in any subject and improve their professional abilities (Creswell, 2005). During this study, attempts were made to develop solutions at different levels and make recommendations accordingly. The research method used was participatory action research, which involves participants within an institution or program collaborating to create a research design, implementing it, and obtaining recommendations for change (Bogdan & Biklen, 2003). The research aimed to evaluate the effectiveness of the internship program. To achieve this, interviews were conducted with all participants, data on intern performances and program

evaluations were collected, and various techniques such as document analysis and content analysis were used to analyze the data.

During the study, 17 individuals participated, comprising of 12 interns and 5 company officials. Among the interns, 9 were part of the regular internship program, while the remaining 3 were assigned to the company project. The interns were segregated into two groups based on their performance indicators for the training programs. Two different training programs were created for two distinct groups. The first group underwent an artificial intelligence-based training program, while the second group underwent a program that met the company's project expectations. The performance indicators for the first group included physical participation in the internship, daily report submission, process chart completion, article presentation rate, the project developed during the internship, the number of NVIDIA certificates received, and any additional voluntary work done outside the program. Meanwhile, the performance monitoring indicators for the second group included problem-solving, adapting and implementing new technologies, writing clean code, using frontend and backend libraries, developing real-time and low latency video streaming application (WebRTC) skills, hardware review skills, and creating an artificial intelligence inference infrastructure (NVIDIA Triton Inference Server Deployment) skills. The second group of interns were evaluated through various projects assigned by an experienced full-stack developer, in addition to the standard internship program. Technical performance was measured using metrics identified in a tool prepared by the responsible training engineer. The overall evaluation took into account the opinions of the interns themselves, as well as those of the responsible engineers and company managers.

This study evaluates the OpenZeka 2021 Summer Internship Program, with researchers and practitioners cooperating to guide the internship process. During the implementation process, the researcher and implementers had several discussions and identified problems. They also took notes on the program's shortcomings. For company and program evaluations, interns used a semi-structured interview form as a measurement tool. The interview form was prepared using various literature studies on internship program evaluation (Karslı, 2015; Abdul Karim, 2009; Özek, 2018), and the researcher created an original form by synthesizing the information gathered. To evaluate the company's internship program, we reviewed literature from various universities on engineering internships and evaluation forms. We prepared relevant questions and conducted individual interviews with participants using a semi-structured form. We analyzed the data collected through content and descriptive analysis techniques and reported our findings. We identified shortcomings in the current plan and addressed some of them during the process. The remaining shortcomings will be considered for the next internship program's action plan.

3. Findings and Interpretation

In this section, we analyze the data collected during the OpenZeka 2021 summer internship program evaluation and interpret the findings from various perspectives.

1) The initial research inquiry was, "What does the action plan entail for the OpenZeka 2021 Summer Internship program?" Within the action research, the following documents were incorporated into the action plan: (1) a chart for monitoring the process, (2) reports for tracking the study's progress, (3) a list of article presentations, and (4) a general diagram of internship duties. Firstly, the documents relating to the planning of the OpenZeka Internship Program were evaluated.

The interns are expected to complete certain topics within specific timeframes, as indicated in the process monitoring chart. These topics include: Fundamentals of Deep Learning with NVIDIA DLI, Hello AI World, Technical Platform Introduction and Applications with NVIDIA JETSON, Autonomous System Development with JetBot and JetRacer Platforms, NVIDIA Transfer Learning Toolkit, NVIDIA DeepStream SDK, NVIDIA Triton Inference Server Deployment, Introduction of Cordatus AI Platform, Hardware-optimized DNN execution of NVIDIA GPU Cloud Models on Edge devices, and Sequential Model Based Execution on Jetson. The training engineers provided the trainees with information on the topics that would be covered in the schedule. The training manager used a chart to assign topics to the trainees and monitored their progress on a weekly basis. Each trainee can use the chart to keep track of where they should be in the internship program

based on the topics and target periods. Reminders were given at specific intervals to help each intern monitor their progress and stay on track.

As part of their internship program, interns were required to submit work follow-up reports detailing their daily activities. These reports included summaries of their research, information and experiences gained from interactions with other interns and experienced engineers, as well as any problems encountered, and solutions found. At the end of each day, the reports were compiled and sent via email to the training manager. While delays in report preparation were rare, there were instances where completed reports were delivered later than expected.

To ensure a fair distribution of tasks, the company created a list of articles for interns to present based on the total number of weeks they were employed. The list included one article per week, and a chart for monitoring and evaluating the presentations was provided to the interns. Out of the 12 interns, nine were assigned to present articles. At the start of the internship, each intern received an email containing a weekly schedule of articles to present. The first articles were presented by the nine responsible interns with a maximum delay of one week. During the training, three trainees expressed that the articles' content was too complicated, while others had trouble preparing the abstract and presentation. As a result, the technique for selecting articles was modified. Previously, the training manager randomly picked articles from NVIDIA's academic publications page, but this was changed to a different method. During the internship program, the interns were instructed to search for articles on specific topics that interested them from the academic publications page. They were then asked to add the articles they found to a "article presentation list" page on Google Drive, which was shared with the entire internship group. While the interns had the freedom to choose their article topic, interviews and observations revealed that they faced some challenges during their presentations. The weekly article presentations experienced delays due to difficulties in translating technical terminology used in the English articles. Additionally, the interns had limited experience in reviewing academic articles. To improve the review process and speed things up, the training manager provided a brief presentation on how to review academic articles using a sample form they had created. The form was then shared with the interns for them to use in their reviews. It was noticed that some of the trainees utilized the suggested techniques during the article review process and found it easier to prepare their presentations after the demonstration. To enhance the submission process, deadlines were periodically extended, additional deadlines were given for incomplete presentations, and the option to present online was made available.

The internship tasks chart is designed to help track the first three documents created as part of the action plan. It also serves as a reminder for submitting social media posts, projects, certificates, and content. Sharing on social media is not required, but many interns reported feeling more confident as they shared their accomplishments on their personal accounts.

2) The second research question was "What are the interns' opinions about the OpenZeka 2021 summer internship program?"

Table 1: Themes and sub-themes related to interns' evaluation of the internship program

Themes	Sub-themes	
The role of the program in professional development	✓ Interaction with engineers from different fields, ✓ Providing an informative and developmental environment, ✓ Supporting career goals	✓ An intensive learning and practice environment ✓ Using many tools while still a student ✓ Visioning ✓ Academic development through article review

Program efficiency	✓ Instructive and efficient ✓ Multiprocess operation ✓ Raising engineering awareness ✓ Gaining work discipline ✓ Integration into work life	○ Not too much workshop style ○ Based on self-learning ○ Insufficient time ○ Heavy content and an intense program ✓ Developing a working AI application using Jetson
Program meets expectations	✓ Quite a lot and above my expectations ✓ Regular follow-up was done ✓ The company management had a family-like approach	○ The program was busy, we couldn't make it. ○ There could have been a different way of working and learning about artificial intelligence. ○ Lack of interaction with experienced engineers
Challenges in the Program Process	○ Advanced education level challenged ○ It was an intense program. ✓ Challenges helped me improve ✓ Engineers helped solve technical and physical problems.	○ Since I live in a remote area, it was difficult for me to come and go to the company. ○ Sometimes it took me a day to correct a mistake. ○ I was afraid to ask questions
Functionality of the process chart	✓ Facilitate self-monitoring ✓ Following the correct order in topic sequencing ✓ A sequence was followed from simple to difficult ✓ Training manager support was provided for monitoring and motivation, and engineering support was provided for content.	○ I could not easily find answers to difficult topics on the internet. ○ The schedule was dense, the subject content was high ○ Insufficient time to catch up
Recommendations for the program	✓ At the beginning of the internship, brief information about the NVIDIA hardware ✓ Teamwork should be more intense ✓ One week should be devoted to hardware and software alone and two weeks to a project combining the two. ✓ Training content should be diversified	✓ Management and engineers' ideas on how to implement the program should not overlap ✓ Since the program is intensive, it should be slightly reduced or the internship period should be extended ✓ Give a project encouraging research on the topics before starting the internship

Table 1 presents the themes related to the interns' evaluation of the internship program.

The table uses a check symbol to indicate positive evaluations and a circle symbol (○) to indicate negative evaluations. The theme of the program's role in professional development includes several sub-themes, such as interacting with engineers from various fields, using multiple tools for academic development and studying articles while still a student, fostering an environment that facilitates learning and practice, supporting career goals, and providing a vision. Based on the feedback provided by the interns, the program had its strengths and weaknesses. While some interns (n=4) mentioned that they did not get the opportunity to work on hardware projects during the internship process, others (n=6) felt that their equipment usage skills improved even further. A few interns (n=2) did not express any opinion on this matter. As per Table 1, the program was evaluated positively for its instructive nature, contribution to engineering skills, provision of multidimensional working skills and work discipline, and the opportunity to develop an artificial intelligence application using Jetsons.

However, it was evaluated negatively for its intensity and difficulty, the need for more self-learning, and insufficient internship time.

For a successful internship program, it is recommended to begin with a short introduction to the NVIDIA hardware that will be utilized during the process. The program should also prioritize interactive teamwork, dedicate one week solely to hardware and software, and allocate two weeks for the project that integrates both aspects. To improve the training program, it is recommended to diversify and simplify the content. It is important for managers and engineers to have a unified approach to implementation. The program should be slightly reduced in content or extended in duration due to its intensity. Research should be encouraged on topics prior to starting the internship. The program should be designed for first-time learners with an empathetic approach. An inductive approach is recommended, and a natural project that the company is developing should be incorporated into the training. The program should be integrated into the training curriculum.

All 12 interns who participated in our company's long-term internship program expressed interest in participating again. However, only 2 interns felt that the university/mentor support was helpful, while 2 others felt it was only partially helpful, and 8 felt it was not helpful at all. Additionally, 4 interns stated that they were not ready for the profession, 3 felt partially ready, and 5 felt mostly ready by the end of the internship. Out of the 5 who felt mostly ready, 3 were hired by OpenZeka, while the other 2 found employment in different companies after interviews conducted approximately 4 months later.

The third inquiry posed was about the interns' overall evaluation of the company. The responses were compiled and presented in Table 2. It outlines the themes and sub-themes related to their thoughts. The data suggests that the interns' initial impression of the company was positive. They appreciated the NVIDIA partnerships, international commercial operations, hardware and training support, professional staff, and the exciting office environment. However, they noted that the physical space was small, which was considered a drawback. The company management raised the issue with Cyberpark but received no positive response due to high demand. Nevertheless, the company moved to a bigger office space after the internship period.

Table 2: Themes and sub-themes related to the general evaluations of the interns

Themes	Sub-themes	
First impressions about the company	✓ NVIDIA partnership ✓ Critical commercial operations ✓ Hardware support ✓ Education support	✓ Expert staff ✓ Exciting office environment Physical smallness
The relationship between the competencies provided by the internship process and the competencies provided by the university	✓ I found the cameras, the Jetbot installation and their simulations related to my field of electrical-electronic engineering. ✓ I can relate some of the laboratory courses I took at the university to the internship process. ✓ Both the university courses and the internship process contributed to my problem-solving skills. ✓ There was almost no relationship between what I learned at the university and the internship program.	

Table 2: Themes and sub-themes related to the general evaluations of the interns

Good engineering approach	✓ Solution-oriented	✓ Determined
	✓ Has an inductive approach	✓ Adapts quickly to changing technologies.
	✓ Curious, highly motivated	✓ Focused on the development of a product.
	✓ Creating a positive environment and focused on developing the team.	✓ People-oriented
	✓ Questioner	✓ Able to think and see differently.
	✓ Durable	✓ Researcher

Based on Table 4, it was observed that some individuals noted similarities and differences between the competencies gained through the internship process and those provided by the university. However, others stated that there was no similarity at all. Notable statements on the topic include: "The university contributed around 30% to my practical knowledge," and "Both the internship process and the university instilled in me a sense of research discipline.", In my professional life, I often use the same problem-solving methods that I learned while completing coding assignments at university. However, the integration process of industrial software and hardware was not covered in my coursework and was only available to me during my internship. During this time, I was also introduced to the field of Image Recognition and was able to improve my knowledge in this area. The C++ and Python courses I took at university also contributed to my growth during the internship. Overall, I would rate the contribution of my university education to my engineering development as 1 unit, my self-study efforts prior to starting my company as 10 units, and the contribution of my internship at OpenZeka as 50 units. In a similar vein, Islam (p.16, 2023) shared their own internship experiences, noting that while they initially faced some difficulties in their management and information systems internship, they were ultimately able to develop professionally, particularly in software and digital marketing.

Table 2 highlights important characteristics for effective engineering, including a solution-oriented mindset, inductive approach, curiosity, high motivation, creating a positive team environment, resilience, adaptability to new technologies, focus on product development, people-oriented, ability to think creatively, research skills, and a curious nature.

4) The fourth research question was "What can be said about the technical performance of the interns?"

In order to assess the technical abilities of the interns, they were divided into two groups based on their backgrounds. The first group participated in a standard internship program that focused on artificial intelligence and deep learning training. The second group, which had prior web development experience and was expected to contribute to the company project, received a different internship program. The first group's performance was monitored based on participation in the internship, daily report submissions, completion of process charts, rate of article presentations, the project developed during the internship, the number of NVIDIA certificates received, and the amount of additional voluntary work done outside the program. The results of this monitoring are presented in Table 3.

Table 3: Distribution of First Group Interns Performances According to Monitoring Indicators

	Internship duration (working days)	Participation * /Continuation Ratio	Process Schedule Completion Rate	Daily Report Delivery Rate	Article Presentation Ratio	Number of Projects (Max.3)	Number of NVIDIA Certification (Max.4)	Additional Studies
S1	20	.95	.40	.70	.50	1	1	1

Table 3: Distribution of First Group Interns Performances According to Monitoring Indicators

S2	20	1.00	.60	.80	.50	2	3	2
S6	20	.90	.40	1.00	1.00	3	3	3
S7	20	.85	.40	.90	.50	2	1	3
S8	20	.85	.50	1.00	.50	1	2	-
S9	30	1.00	.50	1.00	.67	2	4	1
S10	40	1.00	.60	.88	.50	1	3	2
S11	40	.75	.80	.68	.33	3	3	1
S12	30	.50	.60	.67	.17	2	2	-
n=9			*Total*			17	22	13

** Participation periods were calculated for both groups according to the status of continuing to work face-to-face in the physical environment of the company.*

The data in Table 3 shows how the first group of nine participants performed during the standard internship program. The duration of the internship varied from 20 to 40 days, and most of the participants had a high attendance rate of 85% or more, with only two participants having lower rates. The number of daily reports submitted increased as the internship went on. However, the article presentation and process chart completion rates were generally below 50%, which may be because the interns had different readiness levels and the topics were difficult. Some interns also worked on tasks, competitions, or projects outside of the standard internship program based on their interests. Although there was no strict framework for the program, interns were reminded of its objectives throughout the internship.

During their internship, the interns were encouraged to obtain NVIDIA certificates in artificial intelligence and deep learning. Table 1 shows that all participants earned a total of 22 certificates, with a minimum of 1 and maximum of 4 per person. The interns also developed 17 projects using Jetbot and Jetson Nano, including dangerous object detection alarms, helmet recognition for occupational safety, real-time heat mapping, and smart piggy banks.

In addition to their project work, a group of 7 interns translated texts for blog content and analyzed current topics such as NVIDIA Isaac Sim and Omniverse (see Appendix_3). Some interns also received training in web development, including WebRTC, Javascript, and HTML (6 participants), which was reported by the responsible training engineer (see Annex_4).

The second group was assessed based on various skills such as problem-solving, adapting to new technologies, writing clean code, utilizing frontend and backend libraries, developing real-time and low-latency video streaming applications (WebRTC), inspecting hardware, and creating artificial intelligence inference infrastructure (NVIDIA Triton Inference Server Deployment). These skills were identified as performance monitoring indicators and are presented in Table 4.

Table 4: Monitoring Indicators of Second Group Trainee Performances

	Problem Solving	Adaptation to new technologies	Clean code writing*	Using frontend libraries	Using backend libraries	(WebRTC) application development	Hardware review	Artificial intelligence inference infrastructur

Table 4: Monitoring Indicators of Second Group Trainee Performances

								e
S1	.80	.90	.70	.80	-	.80	-	-
S4	.80	.80	.70	.80	-	.90	-	-
S5	1.00	.90	.80	-	.80	-	.80	.90

**The readability and efficiency of the code are taken into account here.*

Based on Table 4, the intern's performance in hardware review and AI inference infrastructure was closely monitored. However, the candidate's progress in front-end libraries and WebRTC application development was not taken into account. The table indicates that all three candidates scored 80% or above in problem-solving, adapting to new technologies, and utilizing backend libraries.

Based on the results, the interns in the second group all scored 70% or higher on performance indicators. Tables 3 and 4 show that the second group generally demonstrated better engineering skills than the first group. This could be due to differences in the acceptance process, as the second group had higher readiness levels and programming skills upon acceptance. As a result, they were considered for employment as interns. This may have contributed to their increased motivation and performance during their internship.

The fifth research question asked about the challenges faced while executing the action plan in the internship program. The small company environment and the global pandemic posed difficulties in implementing certain measures. To overcome this, the management gave the candidates the choice to work remotely, which some of them opted for. However, most interns preferred to work in a physical setting despite the remote option being available. During the official vacation after the second week of the internship, some interns faced challenges. Some didn't have good internet access where they went for vacation, the temperatures were higher than expected, and they were away from the supportive work environment of the company. They found it difficult to take a break from work and re-adjust to the office environment upon their return. This made it challenging for company management and instructor engineers to re-implement the internship program for some of the interns who were distracted after their vacation.

6) The sixth research question was "What can be said about eliminating the problems experienced during the implementation of the internship program?".

In this research, a practice-oriented approach was utilized in order to eliminate or reduce problems through action research. To overcome any difficulties that arose during the implementation of the action plan, improvements were made, such as reducing the number of article reviews and allowing for remote work when necessary. Additionally, personal projects were encouraged, and progress was monitored to ensure the process was appropriate. Although some interns responded positively to these changes, others did not. It should be noted that systematic data collection can be difficult due to the variability of the process in applied action research, which is known to be a more flexible research method (Yıldırım & Şimşek, 2011, p.335). Unexpected events that occurred during the internship program, technical disruptions, leaves taken due to health and family situations, holidays lasting more than a week, and disruptions in the normal functioning of the program affected the variability of this process to a certain extent. Nevertheless, to reduce the difficulties and compensate for the gaps, the interns were supported by the company management and trainers for the rest of the program.

7) The seventh research question was "What can be said about the new action plan?".
The first action plan was designed during the planning phase of the internship program.

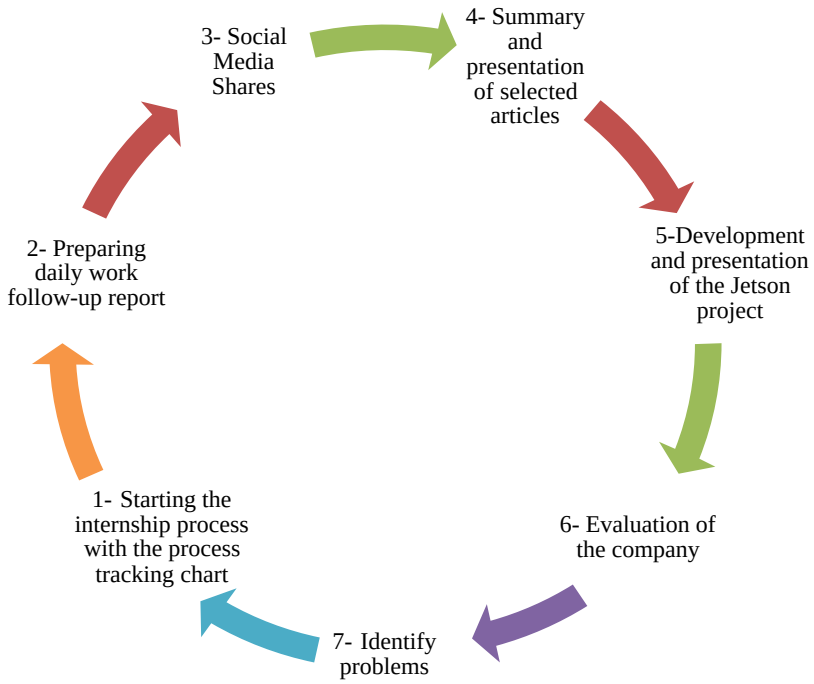

Figure 1: First Action Plan

In Figure 1, the initial action plan consists of seven tasks. These include initiating the internship process with a tracking chart, creating a daily work report and social media updates, summarizing, and presenting articles, developing and presenting the Jetson project, evaluating the company, and identifying any issues. The design covers multiple stages from planning to evaluation. When devising the first action plan, we took into account the practices of other companies in the software industry, input from field experts, academic articles (Kariya, 2002; Tan & Umemoto, 2021), and our previous internship experiences. Following a 14-week implementation, we revised some items in the original action plan. We put some of these revisions into practice during the implementation, while others were incorporated into the new design as the second action plan to be implemented during the next internship process.

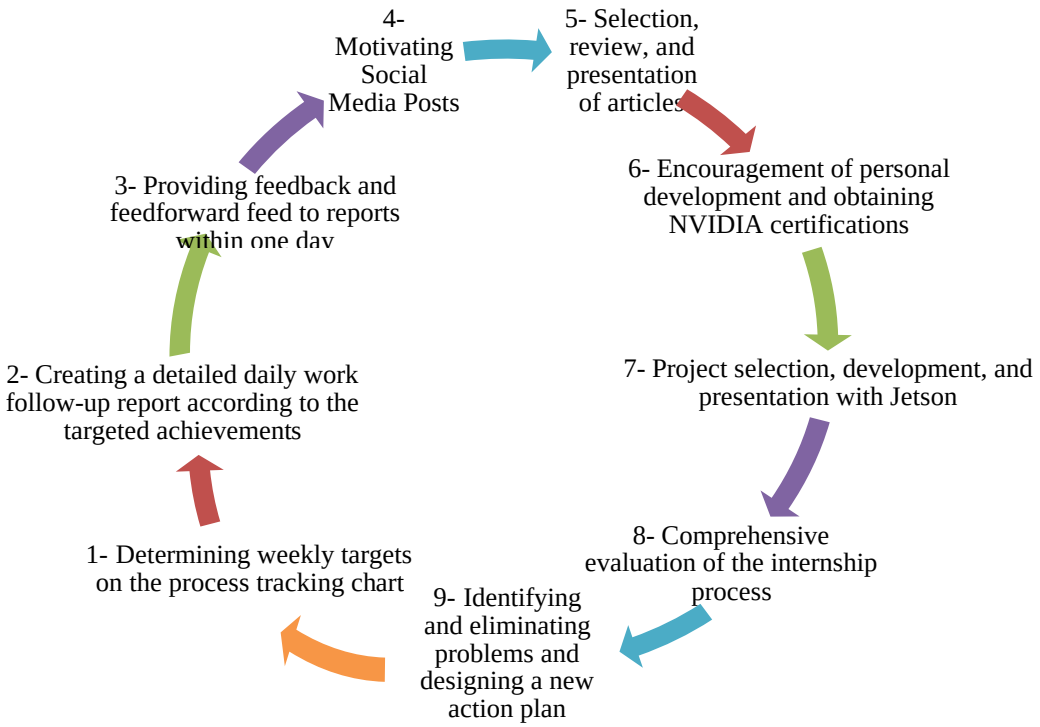

Figure 2: Second Action Plan

Figure 2 displays the second action plan, which comprises a total of nine items. The plan includes two new items - "Providing feedback to reports within one day" and "Encouraging personal development and obtaining NVIDIA certificates" - that were not part of the first plan. Additionally, the plan has been modified to include weekly goals for starting the internship process and creating a detailed daily work follow-up report based on targeted gains. The plan also ensures that the interns are responsible for selecting articles, and the evaluation process is comprehensive and includes all individuals involved in the process. The second action plan is more individualized, encourages development, and is comprehensive in its planning, implementation, and evaluation stages when compared to Figure 1.

4. Discussion and Conclusions

Throughout and following the internship program for OpenZeka's 2021 Summer Internship, the action plan's scope may be adjusted or amended. Certain changes and corrections were implemented during the internship, while others were incorporated into a secondary action plan. However, the interns in the program found the training content to be arduous and challenging, surpassing the expected timeframe. This suggests that the interns' preparedness and the duration of the internship, which is only 20 working days, are inadequate. The interns had a positive overall evaluation of the company, although they expressed dissatisfaction with the physical conditions. Further analysis revealed that interns who participated in the middle of the internship reported higher levels of satisfaction compared to those who participated at the beginning or end of the program. Based on the results, it appears that the interns may not have been adequately prepared for the program, which lasted for 20 working days. Overall, the interns had a positive view of the company, but were dissatisfied with the physical conditions. Interestingly, those who participated in the middle of the internship were more satisfied than those who started or ended the program. This suggests that the most productive and interactive work occurs in the middle of the internship. Going forward, it may be more beneficial to determine the start and end dates of the program based on the common good rather than individual candidate preferences. Additionally, avoiding a lengthy 10-day holiday period could potentially boost productivity. The interns have varying levels of technical ability. It has been observed that the second group of interns is more proficient than the first group, not just in the theoretical concepts learned in university courses, but also in their engineering approach. This highlights the importance of students developing their programming skills, as it can give them an advantage over other candidates when seeking engineering positions.

During the research, a senior executive from the company expressed that their motivation for operating is to fulfill their social responsibility duties and to create human resources for the company. Additionally, another official mentioned that the program accepts four times the legal limit of interns. According to the official, the company aims to develop its human resources, and as such, some interns may have the opportunity to become full-time employees in the future when certain conditions are met. In fact, some prospective engineers who completed the internship program in line with this goal and expressed interest in continuing with the company part-time were able to secure full-time employment after graduation. Kariya (2002) noted that commercial firms often utilize internships as a way to assess potential hires. Accordingly, employers considered internship programs as a more effective method for new hires than other types of recruitment. According to a study, National Instruments aims to employ 25 percent of its interns after they graduate, whereas IBM usually hires one-third of its interns. In some countries, internships are linked to corporate recruitment (Kariya, 2002). Furthermore, over 70 percent of firms in the United States tend to hire interns as full-time staff, but only around half of the interns are promoted to full-time positions (Tan and Umemoto, 2021).

In today's fast-paced world, it's crucial to gain practical experience through internships to meet industry demands, develop global engineering skills, and build a strong foundation in humanities and applied sciences. According to Kariya (2002), Joe Marks, the head of Cambridge Research, believes in a short-term return on investment rather than a long-term one. He suggests that interns can provide some institutions and firms with a cost-effective way of getting work done. An internship program was announced by OpenZeka a month prior to its commencement. It was emphasized that the program would be most effective for interns who managed the process well. Those who successfully completed the program's determined topics received certifications for Fundamental of Deep Learning and Getting Started. Upon completion of their projects, they applied to the NVIDIA Jetson Project page for publication of their studies and were awarded the AI Specialist Certificate for

their accepted projects. The internship process is an effective way for engineering candidates starting their professional life to gain a social environment, improve their skills and acquire new ones (Kocabatmaz, 2011, pp. 17-18).

According to a study by Renganathan, Abdul Karim, and Su Li (2012), students had a positive evaluation of the industrial internship program and found that hands-on experience during the internship led to more effective learning. The study also identified the operational and administrative efforts of the organizers and the role played by the host company as important factors in determining the success of the program.

According to Ozek (2018), the success of an internship program depends on the level of cooperation and commitment from intern students, partner companies, and university academic staff. In addition, the intern's intrinsic motivation and the role of faculty are also crucial factors in a successful internship program. Prabhu (2016) emphasizes the importance of faculty in ensuring the program's continued success.

A properly run internship program can have positive outcomes for the company, educational institution, and participating students in both the short and long term. Studies have shown that the quality of internships has a positive impact on future employment success, and that a student's ability to adapt their career goals is a key factor in their overall success, alongside their proactive personality traits (Pan, Guan, Wu, Han, Zhu, Fu, & Yu, 2018).

Companies with successful internship programs can show how effective their internship process is. A study found that technology and engineering students gained valuable professional experience and skills through summer industrial internships. The training providers within the company were very supportive of the program and provided students with real work experience. Managers also stated that a well-executed internship program helps students gain a better understanding of their job, job performance, and work quality, as well as the opportunity to develop social skills.
As of October 2022, the second batch of engineering trainees are currently employed full-time at the firm. The first group of interns have since found employment in various companies after graduating. Based on feedback from both groups of interns one year after completing their internship, although there were some setbacks, overall, the internship period was successful and had a positive impact on their professional lives.

In this study, we conducted a thorough evaluation of the OpenZeka 2021 summer internship program from the perspectives of interns, employees, and managers. The program provided opportunities for interdisciplinary interactions among engineering disciplines such as computer, electrical and electronics, mechanics, electronics and communication, and mechatronics, regardless of the intern's field of study. Our goal was to develop a distinct model for an internship program implemented in a software company's physical environment and offer insights on what not to do in a good internship program and how to improve it.

5. Recommendations

For researchers evaluating the Internship Program, some suggestions include using the practice-based action research technique as the methodology. Additionally, researchers can explore different methods and techniques including review studies with large-scale field surveys, quantitative studies using a Likert-type graded scale, or case studies. As for companies evaluating the OpenZeka Summer Internship Program, suggestions were made following examinations and interviews. It is recommended that the company determines the start and end dates of the internship within a reasonable timeframe. This ensures that the program runs smoothly and does not interfere with the work of the company's engineers. It is best to avoid a wide range of dates to prevent any disruptions or gaps in the program. Before starting the internship program and selecting candidates, it's important to assign some small tasks to them ahead of time. This will help the candidates come to the program better prepared. If necessary, interns can be divided into smaller groups based on their programming skills and readiness levels. Encouraging interaction within and between these groups will enhance the overall experience. During each day of the internship, instructor engineers are required to develop and execute a comprehensive training program for all groups, lasting a minimum of 15 minutes. Failure to complete assigned tasks or projects on time may negatively impact the intern's evaluation grade.

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