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# Heutagogy Based E-Training: Internship Teacher Digital Competence for an Equitable Global Civilization

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**Abstract**

The development of the digital transformation era has had a major influence on the current occupational fields. The challenges faced by the next generation of the nation are getting bigger; this is also felt by internship teachers (teacher training) who carry out school field introduction programs from universities. Seeing the low output to be able to get the opportunity to become a teacher with a bachelor's degree in education is the main concern of inequitable global civilization. The aim of the research is to focus on knowing the needs of internship teachers related to digital competence training before they carry out the school field introduction program. The research method used is a mixed method with a total of 160 active students at Brawijaya University who will become internship teachers. The results of the study reveal that the need for the aspect of gaining new competencies is 85%, the development of digital competencies is very high, especially in the aspect of integrating digital pedagogy, and the knowledge aspect is 65% for increasing heutagogy-based e-training experiences. This study concludes that the need for internship teachers for the existence of heutagogy-based e-training is very much needed to realize an equitable global civilization in the era of digital transformation.

## 1. Introduction

In the era of digital transformation, it requires the development of digital technology and its application to be able to explore organizational performance through digital competence so that tasks can be completed with various factors such as digital infrastructure, digital integration, and digital management (Yu & Moon, 2021). This is marked by the increasing development of information technology and automation using electronics in all kinds of areas, including education which leads to technical and practical training (Le et al., 2022). The increasingly urgent turmoil and challenges in various fields make all parties require their human resources to continue to train their digital abilities and competencies, because this can maintain the organization in its existence. It is the same with the world of education which is at the tertiary level where students are required to understand basic knowledge of digital literacy and its competencies that have been adapted to the needs of learning activities, especially students who will prepare themselves to become apprentice teachers in educational units as the completion of field introduction courses. schools for prospective undergraduate education.

An educator in this case plays a vital role in the nation's education process which cannot simply be replaced by modern technological sophistication alone, but teacher professionalism in relation to the development of digital competence must be trained for equitable global civilization (Nabung et al., 2022). The construction of the foundation can be reactivated through training programs, both in the form of new education and re-education so that information and communication technology skills can be explored (Polychronidou et al., 2022). It is this limitation of understanding that is fundamental to all kinds of achievements in digital science and technology progress so that it can be rooted in the educational process by continuing to place the basis of digital transformation as the starting point for change towards a better, civilized, and superior quality. The importance of students' skills and competencies requires them to continue to train their abilities in a more creative and innovative way that is integrated with Computer Assisted Instruction (CAI) for educational training activities (Wulansari & Nabawi, 2021).

Internship teachers are a part that is often considered the most core of all kinds of teacher education, because it is there that they clearly gain direct teaching experience and this can also be improved periodically with various digital technology trainings to be able to encourage teacher professional development (Michos et al., 2022). Training is an important thing to do because this activity is one of the techniques in the study of supervision, so it is considered capable of developing abilities in the learning process. Factors that educators need for teaching purposes can be developed through innovative use of digital (Sunandar et al., 2022). The process of training activities is able to produce education that has a superior level of professional competence in accordance with the expertise in each field of knowledge. Training activities in teacher internship programs can show real teaching results through more meaningful work experience as educators. This can help accelerate the achievement of national education goals and improve the quality of learning (Romlah et al., 2023). The average response obtained from teachers regarding the level of need for implementing digital competency training activities also varies between 2.89-1.80 with an interpretation of the degree of evaluation between large and medium (Al Shabibi & Al Shabibi, 2021).

The need for the nation's generation for an equitable global civilization is a strong reason for continuing to upgrade active students who want to become prospective teachers where they play an important role in educating the next generation with 21st century competencies which always go hand in hand with modern technology and artificial intelligence. The challenges of the 21st century in global competition are also experiencing dramatic acceleration, so this is the reason why a smart education system must prepare students with digital competencies and skills to build a conceptual framework for internship teachers in Indonesia (Afandi et al., 2019). The progress of a nation is greatly influenced by the progress of intelligent education, which is included in the field of education which is on the shoulders of teachers, so teacher professionalism needs to be improved (Tampang & Wonggo, 2018). The identity of professional teachers is currently an important factor in their motivation, effectiveness, and retention in teaching activities so that the teacher's apprentice environment is also able to increase extraordinary learning engagement, because it is able to show a strong relationship between internship teachers and professional identity (Cai et al., 2022).

The need for heutagogy-based learning and training is able to provide an approach that can encourage self-efficacy, self-determination, self-directed and self-regulated learning for lifelong learning more effectively to meet the educational needs of the digital era (Kim, 2022). The need for new forms of student-centred learning and training capable of contributing to individual professional development in adopting today's educational heutagogy (Stoten, 2020). Heutagogy is starting to be applied in all aspects of education at various levels, so there is an urgency if not implementing heutagogy in practice will structurally affect the development of students' abilities (Chamo et al., 2023).

The implementation of an internship program for students in tertiary institutions shows that practical teaching knowledge in the field can directly develop the hard skills and soft skills that are really needed by students who want to work as teachers in the future. (Tindowen et al., 2019). If universities want their graduates or alumni to have professions that are in accordance with their basic education while carrying out their studies optimally, then before entering the apprenticeship program these students or prospective teachers must be equipped with heutagogy based e-training. Heutagogy in teacher competency training, especially those honing digital technology knowledge which is increasingly developing among the wider community, can be useful in being able to install a culture of lifelong learning among teachers (Thakur, 2018). Heutagogy based e-training is a form of training that is considered very applicable and effective for improving and strengthening the quality, professionalism and creativity of teaching internship teachers in optimizing the application of digital technology so that they can integrate it into classroom learning in a comprehensive manner. The heutagogy approach in teaching and learning activities and training is the focus of studies on improving and strengthening the quality of 21st century educators.

## 1.1 Heutagogy Based E-Training

Several policy makers have various important factors related to increasing student acceptance of e-training in tertiary institutions (Alghamdi et al., 2022). The need for e-training for active students is considered to be

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increasing along with the times that increasingly utilize modern technology in the application of teaching and learning activities. E-training is able to offer amazing opportunities in terms of access in a global environment as well as in learning activities, especially in the field of work (Hase, 2018). Heutagogy based e-training is able to provide learning about aspects of education, knowledge in digital-based learning innovations, and other things related to the competencies that educators should have. E-training can be a meeting point between learning theory accepted so far and real practice in the world of work which is quite complex where change or exponential becomes a norm and an important adaptation for an individual or a particular organization. The training obtained certainly provides assistance to provide learning in overcoming all kinds of problems that are often encountered in the world of work (Apriani et al., 2021).

The heutagogy approach in teacher professional education in Indonesia can be an effort in itself to be able to improve and develop teacher competence in order to become professional educators. The heutagogy approach has several elements that have been clearly analyzed and incorporated into the TPE model with support from modern online learning tools. The key elements included include learning that can be determined by the learner himself, the results of metacognitive reflection, collaboration in learning activities, and regular capacity building (Handayani et al., 2021). The dynamic combination between heutagogy and the use of technology can be a fundamental basis for students for their lifelong learning, because the training adopts a new way of teaching and learning where students must be able to become more independent in each of their learning processes (Blaschke, 2021). As for the intention of sustainability in learning activities using e-training itself, it all depends on the experience of program participation with implications for each organization to be able to prepare and provide e-training facilities for its users (Ismail et al., 2020).

## 1.2 Internship Teacher Digital Competence

In the implementation of the training obtained, of course, knowledge about the factors that can affect digital teaching competence for teachers is very important for educational institutions so that training plans that have been designed in such a way can be realized in accordance with the needs of students in the digital transformation era (Sánchez et al., 2020). The application of modern technology that is increasingly developing in the world of education makes contemporary society have various demands related to education at the tertiary level based on an active and participatory education model where this allows competency development that incorporates digitalization in it (Romero-García et al., 2020). Other research studies suggest that proposing training for prospective teachers in the use of digital programs such as open software, existing norms regarding online communication, and some ethics related to the use of technology and responsibilities as users are necessary in realizing the digital competencies of prospective teachers when they are in a real environment (Torres-Hernández & Gallego-Arrufat, 2022).

The challenge of a new educational paradigm has now emerged so that it becomes a necessity in its application. The real need for educational institutions to be able to continue to develop their teacher training performance is a common thread that is tied to quality human resources so that the increase in teachers who have digital competence can continue to increase along with the development of the world of modern technology (Guillén-Gámez et al., 2022). Over the last few years, digital transformation has become increasingly felt with the existence of information and communication technology which plays a very important role in improving the quality of human life. The potential for digitalization in the field of education still needs to be developed, especially with regard to digital competence, which is a challenge for teachers and this can be overcome with adequate digital teacher training (Fernández-Batanero et al., 2022).

## 1.3 Equitable Global Civilization

Explorations related to contemporary international travel into the current global civilizational order become a global future, especially for institutions working in this new type of order (Antonescu, 2022). Periodic improvement in relation to the quality of teachers in Indonesia is a global challenge so that the government must be able to provide best practice in the world of education related to increasing the capacity and competency of teachers where it also aims to design professionalism development training programs for teachers (Mu'arifin & Narmaditya, 2022). Future studies must continue to explore all kinds of global challenges faced by teachers related to educator performance that can be measured in the same system (Luguetti & McLachlan, 2021).

Education in the context of global civilization can increase the linkages and interdependence of the world in placing various kinds of instructions that have never happened before in teacher education programs where this exists to prepare teachers to welcome 21st century education (Guo, 2013). An analysis of the three main mechanisms that strengthen inequality in global citizenship in tertiary institutions includes the path of higher education policies towards teaching or learning activities from face-to-face to online mode, limited infrastructure which is a challenge in implementing effective learning activities, and lack of support strong pedagogic through proficiency in english as well as digital technology skills (Devkota, 2021). The transition to the global education system is a challenge to be able to continue exploring the effectiveness of need-based

teacher training programs in order to be able to overcome the problems that occur in the world of education. This training program that prioritizes the needs of teachers is thought to be able to improve teaching quality effectively by developing technology skills, self-confidence, satisfaction, motivation, time management skills, and changes in teacher behavior (Ahmmed et al., 2022).

## 1.4 Study Objective

The purpose of this study is to see and needs analysis of internship teachers for heutagogy based e-training where it is able to develop digital competence in an equitable global civilization. The training model that utilizes modern heutagogy-based technology is chosen based on the ability of adults who will become prospective teachers to manage their own learning independently in accordance with the current developments in the digital transformation era. Heutagogy based e-training is carried out before the internship teachers serve in related education units that have partnered with universities to carry out internship programs for introductory field schooling courses for several months. As for research questions related to this include, among others:

- What is the purpose of the internship teacher in participating in the heutagogy based e-training for equitable global civilization?
- How does the need for heutagogy based e-training affect the digital competence of the internship teachers?
- What are the criteria for improving internship teacher's learning experience through heutagogy based e-training?

The implications of this research have the potential to increase the number of graduate students with bachelor's degrees in education to become teachers or lecturers in the field of education who are able to make full use of information and communication technology through the development of digital competencies based on training provided by universities.

## 2. Method

The mixed methods approach is used to be able to investigate various kinds of problems that are considered quite complex so that in the process a combination of quantitative research and qualitative research is required in order to obtain more actual results. (Creswell & Clark, 2018). The research design with a mixed methods approach. The mixed methods research used is predominantly quantitative with the initial steps being to carry out quantitative data analysis, quantitative research findings, qualitative data collection techniques, after that enter qualitative data analysis, qualitative research findings, and finally combine both quantitative and qualitative findings into one so that get the desired result. Aspects of digital competency of intern teachers can be considered further in Table 1.

**Table 1** *Distribution of the questionnaire*

| Variables | Questions | Description |
|---|---|---|
| Using digital technology | 6 | Understand the components of computer systems, understand computer networks, understand websites and obtain knowledge, understand how to use Microsoft word processor, understand how to use Microsoft spreadsheet, and understand how to use Microsoft power point. |
| Data information and knowledge | 6 | Understand the meaning and importance of information, understand the role of information, know the benefits of information, understand the characteristics of communication, understand the importance of data communication, and understand the components of data communication. |
| Communication and collaboration | 5 | Understand communication systems via wireless networks, understand the components of the communication process, understand the nature of communication, apply Microsoft teams, and apply collaboration tools. |
| Digital content creation | 3 | Have knowledge of the subject matter taught, track the progress of the subjects taught, and increase ability by sharing knowledge with educators who teach in the same subject. |
| Integrating digital pedagogy | 4 | Understand the meaning of teaching design, understand the components of teaching and learning, transferring knowledge is in accordance with the theories and principles, transferring knowledge is in accordance with the styles and teaching methods, and applying new teaching techniques and methods for teaching content. |
| Ethics of using digital technology | 5 | Understand the meaning of the ethics of digital technology, understand the principles of the ethics of using digital technology, understand copyright infringement, understand the penalties, and understand free software. |

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Respondents obtained in this study were 160 active students who program school field introduction courses so that they will become internship teachers in education units. Data collection was carried out using the help of Google Form which was distributed online to active students of the internship program. Data were analyzed using IBM SPSS Statistics 22 in order to obtain accurate data analysis results. After conducting quantitative data analysis, qualitative analysis data is then collected to support the findings of previous data so that it becomes more complete.

Qualitative data collection was also carried out on participants from students who were internship teachers in the school field introduction program. The way to collect qualitative data is through direct interviews at universities before training activities take place according to schedule. This aims to see response to the goals of students who become internship teachers, so that implementation of training activities is increasingly focused on the needs of prospective teachers.

## 3. Result and Discussion

### 3.1 Internship Teachers' Purposes in the Heutagogy Based E-Training

Internship teachers' purposes in the heutagogy based e-training concerns five aspects including increasing teacher professionalism, gaining new competencies, improving teaching skills, developing course grades, and wanting to become a teacher as for Fig. 1 is the percentage result obtained in the study. Interview results from students of the school field introduction program related to their main goals in participating in apprentice teacher training include:

- "I feel that becoming a digital era teacher is the main purpose to be able to make the nation smarter by utilizing various facilities and sophistication of artificial intelligence."
- "Training activities are certainly very beneficial for me in relation to developing course grades which I believe can become a good portfolio in the future."
- "Digital training has recently become very popular among students because it can increase teacher professionalism optimally and on target."
- "If I want to become a teacher, then I have to continue learning with the first step being increasing training, especially to gaining new competencies that can help teaching and learning activities."
- "I just want to continue developing my teaching skills so that I can have a bright future."

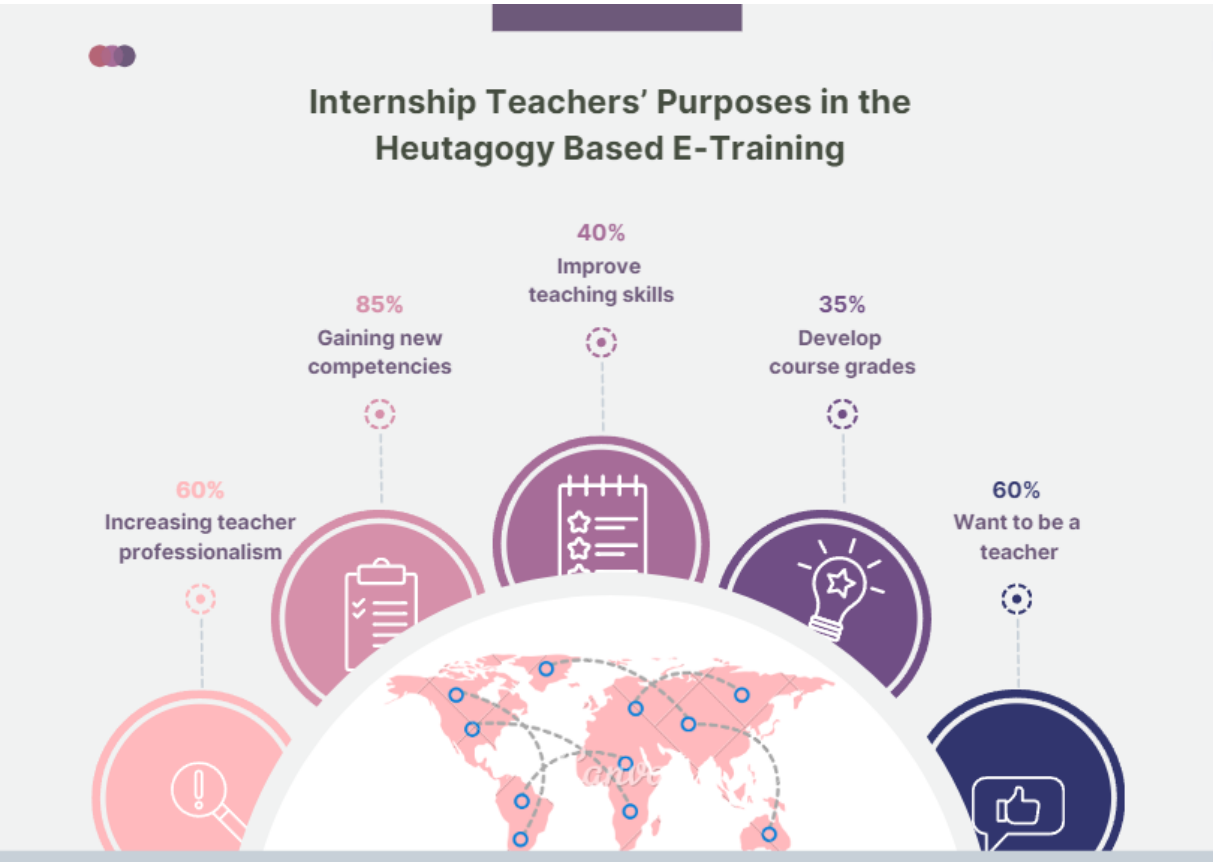


**Fig. 1** *Internship teachers' purposes in the heutagogy based e-training*

These findings explain that of the 160 students who wish to carry out heutagogy based e-training before entering the per-school field introduction program in higher educational institutions the goal is gaining new competencies of 85%. For the lowest percentage of the purpose of internship teachers conducting training is a develop course grade of 35%. Internship teachers' purposes in the heutagogy based e-training have the same percentage of 60% in the aspects of increasing teacher professionalism and wanting to be a teacher, while the others choose improve teaching skills with a total percentage of 40%. One way that is considered practical and effective for gaining new competencies based on self-directed learning is to use electronic learning or training or the integration of digital technology so that theoretical understanding can increase (Ramadhan & Jalinus, 2021).

Positive changes in the field of education, of course, begin with the quality of teachers as educators and their professional progress in developing educational institutions with the expansion of digital technology so that teachers are also able to apply digital devices when teaching with the competencies they have received from training (Kožuh et al., 2021). In line with research which found that teachers' low digital competence can be influenced by age factors, previous information and communication technology training, degrees, teaching experience, and professional categories owned by teachers (Hinojo-Lucena et al., 2019). Therefore, training factors that aim to gain new competencies are needed by teachers in their professionalism for teaching and learning activities. From these findings it can be seen that internship teachers need gaining new competencies to be able to prepare for their teaching activities in educational units that have partnered with universities, so that the output obtained is also maximized with the e-training.

## 3.2 Needs Analysis for Heutagogy Based E-Training Digital Competence

Initial analysis using software assistance was carried out to determine the needs for heutagogy based e-training digital competence of intern teachers in higher education. Factor analysis was also carried out in this research to reduce each variable of digital competence, so that the equation becomes more effective and simpler. This also helps to look for factors that can explain the relationship or correlation between various indicators. The analysis results from IBM SPSS Statistics 22 include KMO and bartlett's test, anti-image matrices, communalities, total variance explained, scree plot, component matrix, rotated component matrix, and component transformation matrix can be seen in Table 2.

**Table 2** *Analysis results from IBM SPSS Statistics 22*

| Analysis Results | Interpretation |
|---|---|
| KMO and bartlett's test | Kaiser-meyer-olkin measure of sampling adequacy is 0.630 > 0.50 while for bartlett's test of sphericity (sig.) 0.000 <0.05. |
| Anti-image matrix | MSA value of using digital technology is 0.640 > 0.50, data information and knowledge is 0.560 > 0.50, communication and collaboration is 0.579 > 0.50, digital content creation is 0.721 > 0.50, integrating digital pedagogy is 0.656 > 0.50, and ethics of using digital technology 0.769 > 0.50. |
| Communalities | Extraction from using digital technology is 0.672 > 0.50, data information and knowledge is 0.948 > 0.50, communication and collaboration is 0.908 > 0.50, digital content creation is 0.637 > 0.50, integrating digital pedagogy is 0.635 > 0.50, and ethics of using digital technology 0.735 > 0.50. |
| Total variance explained | There are two factor variations that are formed so as to explain 75.583% of the variation with details from initial eigenvalues. The first component is 43.468% and the second component is 32.116%. |
| Scree plot | Component points that have more than one eigenvalues are two points with a total of two factors formed. Total for the first component is 2.608, while the second component is 1.927. |
| Component matrix and rotated component matrix | The first factor consists of data information and knowledge is 0.974, communication and collaboration is 0.948, and ethics of using digital technology is 0.799. The second factor consists of using digital technology is 0.819, digital content creation is 0.791, and integrating digital pedagogy is 0.797. |
| Component transformation matrix | Correlation for component one is 0.914 > 0.50, while correlation for component two it is 0.914 > 0.50 so that it can be concluded that correlation values are all appropriate and it is stated that data is feasible for further analysis. |

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### 3.2.1 Using Digital Technology

Results of the research on competency needs of digital internship teachers for aspect of using digital technology can be seen in Table 3. Data analysis provided results indicating that understand the components of computer systems is very important in digital competency training activities for aspects of using digital technology (M = 4.25, n = 160).

**Table 3** *Using digital technology*

| Using Digital Technology | Mean | Std. Deviation | Test Statistic |
|---|---|---|---|
| Understand the components of computer systems | 4.25 | 0.624 | 0.306 |
| Understand computer networks | 4.05 | 0.671 | 0.280 |
| Understand websites and obtain knowledge | 3.75 | 0.832 | 0.218 |
| Understand how to use Microsoft word processor | 3.65 | 0.913 | 0.212 |
| Understand how to use Microsoft spreadsheet | 3.50 | 1.028 | 0.187 |
| Understand how to use Microsoft power point | 3.80 | 1.080 | 0.217 |

Digital competence is one of the main competencies for lifelong learning that needs to be developed with the optimal application of information and communication technology so that a digital identity can be formed (Fraile et al., 2019). Using digital technology can change the teaching and learning process to be more effective and efficient, especially in the era of digital transformation where all work has been assisted by modern technology so that it greatly simplifies the teacher's task. The renewed higher education agenda to develop digital readiness model is a special passion so that educational institutions, staff, lecturers, students can maximize digital learning strategies and be able to competently apply the potential of latest technology (Stare et al., 2023).

### 3.2.2 Data Information and Knowledge

Results of the research on competency needs of digital internship teachers for aspect of data information and knowledge can be seen in Table 4. Data analysis provided results indicating that understand the meaning and importance of information and know the benefits of information are very important in digital competency training activities for aspects of data information and knowledge (M = 3.05, n = 160).

**Table 4** *Data information and knowledge*

| Data Information and Knowledge | Mean | Std. Deviation | Test Statistic |
|---|---|---|---|
| Understand the meaning and importance of information | 3.05 | 0.867 | 0.223 |
| Understand the role of information | 2.80 | 0.930 | 0.265 |
| Know the benefits of information | 3.05 | 1.027 | 0.269 |
| Understand the characteristics of data communication | 2.70 | 0.957 | 0.368 |
| Understand the importance of data communication | 2.70 | 0.845 | 0.296 |
| Understand the components of data communication | 2.75 | 1.046 | 0.313 |

Digital competence of teachers in an all-technology era or in the context of education is one of key factors to guide the teaching and learning process of intelligent people who have data information and knowledge through digital literacy. In line with research which states that in general the self-perception of teachers' digital competence is rated high because they are considered more competent in aspects of ethics, communication, and the use of resources related to digital applications which are also related to the use of data knowledge and information in digital technology for learning (Marimon-Martí et al., 2023). The results of diagnostic section have been generalized so as to be able to prove effectiveness of the digital competence development system for future teachers that combines innovative information and communication technology (Fursykova et al., 2022).

### 3.2.3 Communication and Collaboration

Results of the research on competency needs of digital internship teachers for aspect of communication and collaboration can be seen in Table 5. Data analysis provided results indicating that apply collaboration tools is

very important in digital competency training activities for aspects of communication and collaboration (M = 3.20, n = 160).

**Table 5** *Communication and collaboration*

| Communication and Collaboration | Mean | Std, Deviation | Test Statistic |
|---|---|---|---|
| Understand communication systems via wireless networks | 3.10 | 1.183 | 0.274 |
| Understand the components of the communication process | 2.70 | 0.903 | 0.331 |
| Understand the nature of communication | 2.90 | 0.946 | 0.258 |
| Apply Microsoft teams | 2.90 | 1.047 | 0.305 |
| Apply collaboration tools | 3.20 | 1.080 | 0.217 |

Digital competency in this aspect shows the highest percentage of 55% understanding the components of the communication process, which is in line with research which produced the finding that 403 respondents from Padang State University in Indonesia and Tun Hussein University in Malaysia indeed needed 21st century soft skill competencies in the form of critical thinking, creative, communication, and collaboration skills or commonly known as 4Cs skills (Jalinus et al., 2023). The urgent need to be able to form teacher digital competence has made several parties demand solving problems by carrying out teacher digital competency training that applies digital technology-based methods in education and the development of multimedia content, communication and collaboration to realize educational goals (Niyazova et al., 2022). This is reinforced by several findings which state that teachers must be able to graduate from Teacher Education (TE) with Professional Digital Competence (PDC) so that future work life in smart education can be realized properly (Lindfors et al., 2021). Such a policy makes internship teachers have to work harder so that later they can be accepted among intelligent people who are currently implementing digital technology in all kinds of aspects of life, especially in matters of communication and collaboration. Based on these findings, the implementation of training for intern teachers needs to condition learning activities that can develop digital competencies, especially communication and collaboration skills, so that students can meet the needs of the 21st century.

### 3.2.4 Digital Content Creation

Results of the research on competency needs of digital internship teachers for aspect of digital content creation can be seen in Table 6. Data analysis provided results indicating that have knowledge of the subject matter taught is very important in digital competency training activities for aspects of digital content creation (M = 4.05, n = 160).

**Table 6** *Digital content creation*

| Digital Content Creation | Mean | Std, Deviation | Test Statistic |
|---|---|---|---|
| Have knowledge of the subject matter taught | 4.05 | 0.867 | 0.227 |
| Track the progress of the subjects taught | 3.95 | 0.807 | 0.275 |
| Increase ability by sharing knowledge with educators who teach in the same subject | 3.90 | 0.833 | 0.248 |

The use of digital technology in all kinds of activities related to educational progress is also very necessary (Ulfatin et al., 2022). A previous study conducted by 536 in-service teachers from Gansu Agricultural University in China who responded to digital competency showed that their self-assessment was recorded as positive in terms of information and data literacy, communication and collaboration, security and problem solving, while for aspects of digital content creation is still negative (Zhao et al., 2021). The findings of this research can be interpreted as meaning that there is still a need for training related to digital content creation in the context of higher education as well as experience in developing digital competence. Previous research also strengthens findings related to the importance of considering digital competence by training in digital content creation to support smart learning in the context of a learning and teaching environment based on the support of modern technology (Pérez-Escoda et al., 2021).

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### 3.2.5 Integrating Digital Pedagogy

Results of the research on competency needs of digital internship teachers for aspect of integrating digital pedagogy can be seen in Table 7. Data analysis provided results indicating that understand the meaning of teaching design is very important in digital competency training activities for aspects of integrating digital pedagogy (M = 4.80, n = 160).

**Table 7** *Integrating digital pedagogy*

| Integrating Digital Pedagogy | Mean | Std, Deviation | Test Statistic |
|---|---|---|---|
| Understand the meaning of teaching design | 4.80 | 0.512 | 0.502 |
| Understand the components of teaching and learning | 4.70 | 0.559 | 0.454 |
| Transferring knowledge is in accordance with the theories and principles | 4.65 | 0.574 | 0.429 |
| Transferring knowledge is in accordance with the styles and teaching methods | 4.60 | 0.585 | 0.403 |
| Applying new teaching techniques and methods for teaching content | 4.70 | 0.559 | 0.454 |

The process of digitizing educational institutions currently relies on the high level of digital competency of teachers where this is demonstrated in the rapid development of digital tools and professionally integrating digital pedagogy so that the design of disciplined education programs is based on the foundation of advanced training courses on the use of digital tools in every teaching and learning process (Igonina et al., 2022). Integrating digital pedagogy in teacher studies is very important to be able to achieve superior and quality education (Carrillo-Lopez & Hernandez-Gutierrez, 2022). These results allow special attention to be given to a better educational context in order to create and develop teacher training schedules which in the future can contribute to realizing the quality of teaching and learning activities in certain educational units. Other findings also confirm that a well-executed training program, especially regarding integrating digital pedagogy, has a positive impact on increasing teacher professionalism development and is able to provide a high sense of satisfaction with the training program which is carried out regularly (Fernandes et al., 2023).

### 3.2.6 Ethics of Using Digital Technology

Results of the research on competency needs of digital internship teachers for aspect of ethics of using digital technology can be seen in Table 8. Data analysis provided results indicating that understand the meaning of the ethics of digital technology is very important in digital competency training activities for aspects of ethics of using digital technology (M = 3.60, n = 160).

**Table 8** *Ethics of using digital technology*

| Ethics of Using Digital Technology | Mean | Std, Deviation | Test Statistic |
|---|---|---|---|
| Understand the meaning of the ethics of digital technology | 3.60 | 0.973 | 0.310 |
| Understand the principles of the ethics of using digital technology | 3.45 | 0.671 | 0.299 |
| Understand copyright infringement | 3.55 | 0.671 | 0.344 |
| Understand the penalties | 3.30 | 0.957 | 0.218 |
| Understand free software | 3.20 | 1.126 | 0.220 |

Explore digital competence through Teacher Educators (TEDs) that focus on using digital technology and the ethics of using it responsibly (Nagel, 2021). Supported by other research which says that the globalization of technology has caused many changes in social behavior and ways of teaching and learning in educational institutions which currently require ongoing training in relation to the code of ethics for developing teacher digital competence (Cañete Estigarribia et al., 2021). The correlation between using digital technology and ethics using digital technology is also related to one another, so training is needed to be able to balance this. Strengthening the need for educators to obtain digital competency training related to the ethics of using digital technology is in line with previous research which stated that only 26.1% of teaching guides include ethical

dimensions (Novella-García & Cloquell-Lozano, 2021). This suggests that prospective teachers currently receive little training regarding the ethical aspects of using digital technology in developing digital competencies.

## 3.3 Improvement of Heutagogy Based E-Training Experience

Improvement of heutagogy based e-training experience for internship teachers are divided into four aspects including knowledge, technical, experience, and content whose findings can be seen in Fig 2. Interview results from students related to their improvement of heutagogy based e-training experience include:

- "Training that uses e-training is expected to further strengthen digital literacy."
- "I want new innovations in e-training, especially those related to teaching practices, not only theory but also practitioners through various simulations or interactive videos."
- "When implementing a digital training it is also necessary to provide attractiveness."
- "In my opinion, another thing is quite important in terms of the material being conveyed well."

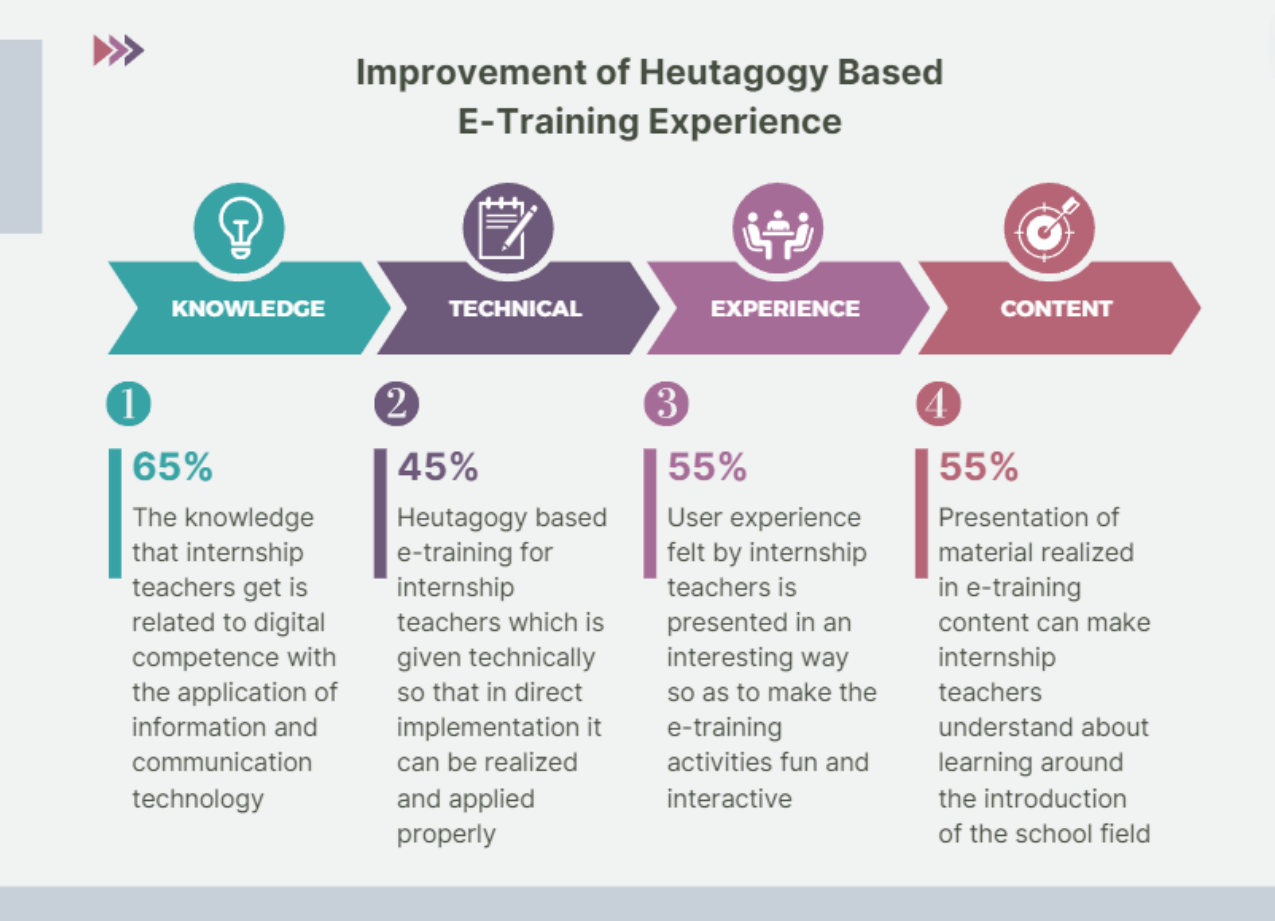


**Fig. 2** *Improvement of heutagogy based e-training experience*

Findings show that the most important aspect needed for improvement of heutagogy based e-training experience is knowledge with a percentage of 65%. The experience and content aspects show a balanced percentage of 55%, then the lowest improvement is technical with a total percentage of 45%. The results show that internship teachers really need knowledge about school field introduction programs that can be practiced directly in education units based on 21st century digital competencies with the many applications or utilization of information and communication technology so that smart education can be realized optimally. Knowledge about Professional Digital Competence (PDC) for teachers is increasingly important to be applied in the learning environment, because digital resources and digital media are an important part of daily teacher practice when teaching and learning activities take place (Gudmundsdottir & Hatlevik, 2018). Basically, with every new generation that exists today, a new digital era will also be born automatically. Therefore, knowledge about digital competence in education is the key to success in fulfilling the professional role of the teacher in the midst of changing societal demands (Válek et al., 2022). Additional findings obtained from the perceptions of internship teachers regarding improvement of heutagogy based e-training experience can be seen in Fig. 3.

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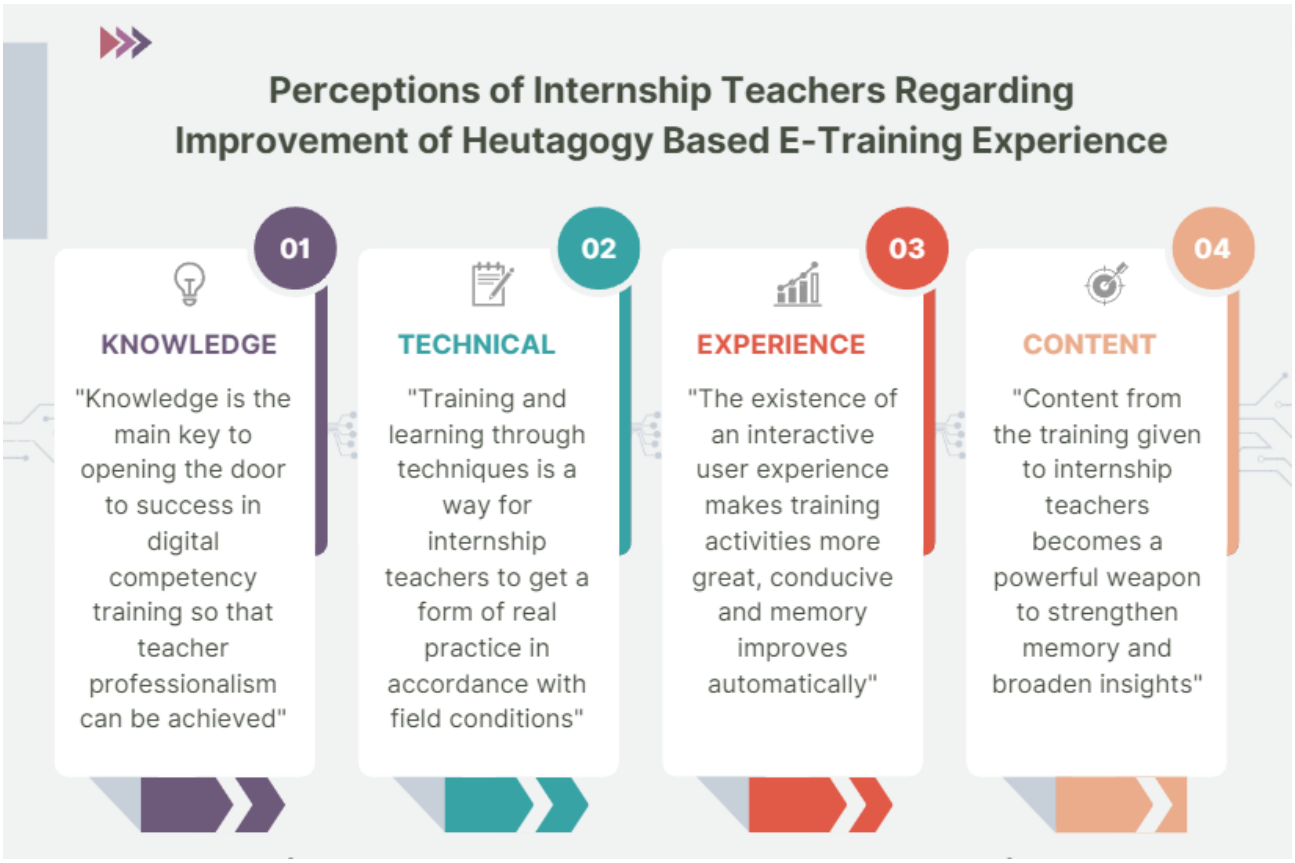


**Fig. 3** *Perceptions of internship teachers' regarding improvement of heutagogy based e-training experience*

The potential for digital transformation for an equitable global civilization has presented new challenges for teachers, so it is important to acquire digital competence through a variety of knowledge from intense training and guidance (Dias-Trindade et al., 2020). This is also corroborated by other research which says that the development of information and communication technology is currently causing quite a big change so that it requires teachers to always update their scientific fields in more depth accompanied by the ability to use digital devices in class based on the knowledge they have previously obtained (Martínez-Rico et al., 2022). The application of digital pedagogy in teacher education programs also needs to be honed further so that digital competency knowledge becomes a separate reform so that the aim of handling the uptake of digital knowledge is to be continued and to make teacher expertise increase regularly (Tomte, 2022). This is also strengthened by research findings which state that the quality of higher education is very necessary to improve the process of stable educational performance, so that various continuous learning and innovation related to education need to be improved (Arjanto et al., 2023). The power of educational management information systems with digital utilization is able to provide considerable benefits for the progress of education, which is in line with the results of research on the importance of teacher professional development (Maisyaroh et al., 2021).

## 4. Conclusion

The conclusion of the study includes the internship teachers' purposes in the heutagogy based e-training with the finding that the aspect of gaining new competencies, which means that internship teachers tend to wish for e-training where they can further develop new competencies according to the needs of the digital transformation era and capabilities of 21st century teachers. Needs analysis for heutagogy based e-training digital competence based on field findings shows that the need for internship teachers to be able to continue to train and develop digital competence is very high, especially in the aspect of integrating digital pedagogy. The biggest improvement of heutagogy based e-training experience for internship teachers lies in the knowledge aspect, which explains that the knowledge that internship teachers get is related to digital competence with the application of information and communication technology.

Based on these findings, this research provides several recommendations to related parties, such as universities that have teacher internship programs for students to apply their knowledge in the field of education in a real way. The first recommendation is to provide an open socialization space for students who become apprentice teachers with basic teaching according to the university curriculum and standards. This will enable students to gain initial knowledge related to teacher internship programs in a comprehensive manner by

providing positive exposure from resource persons or teaching practitioners at certain educational institutions. The second recommendation is to allocate a budget for digital teacher internship competency training activities and prepare adequate facilities and infrastructure, so that the process of transferring knowledge and teaching skills can be obtained optimally. Intern teacher digital competency training must of course be integrated with technology so that students' interest in implementing teaching practice programs can increase. The third recommendation is to ensure alignment of training between internship teachers with the needs of 21st century educators. In fact, 21st century educators have various challenges that need to be studied more deeply by implementing heutagogy based e-training where practical teaching learning focuses on students. This certainly increases the efficiency and effectiveness of ongoing training for apprentice teachers in universities. The implication of this research is to realize the success of internship teachers professionally with the help of intensive heutagogy based e-training so that the output of students who wish to become teachers in the future can be well realized and can adapt to the development of an increasingly modern era relying on technology and digital competence in all teaching and learning activities of the 21st century so that equitable global civilization is perfectly formed.

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## Conflict of Interest

The authors declare no conflict of interest in carrying out this research.

## Author Contribution

*The authors confirm contribution to the paper as follows:* ***study conception and design:*** *Ghasa Faraasyatul 'Alam, Bambang Budi Wiyono;* ***data collection:*** *Ghasa Faraasyatul 'Alam, Muslihati;* ***analysis and interpretation of results:*** *Ghasa Faraasyatul 'Alam, Burhanuddin;* ***draft manuscript preparation:*** *Ghasa Faraasyatul 'Alam, Bambang Budi Wiyono, Burhanuddin, Muslihati. All authors reviewed the results and approved the final version of the manuscript.*

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