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# Correlation of Blended Learning Aspects Based on Characteristic of Education and Training Participants based on the iPosyandu Midwife Application

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***ABSTRAK***

*Pendidikan dan Pelatihan (Diklat) dengan blended learning merupakan pelatihan dengan pembelajaran yang dilakukan tatap muka secara langsung dan tidak langsung (synchronous dan asynchronous). Pembelajaran asynchronous dapat menggunakan aplikasi iPosyandu sebagai media pembelajaran pada pelatihan profesional. Akan tetapi, keberhasilan dalam proses pembelajaran asynchronous menggunakan aplikasi iPosyandu bidan berhubungan dengan karakteristik peserta pelatihan. Penelitian ini bertujuan untuk menganalisis aspek blended learning berdasarkan karakteristik peserta pendidikan dan pelatihan (diklat) berbasis Aplikasi iPosyandu Bidan. Metode penelitian ini menggunakan quasi experimental dengan posttest design. Pengumpulan data pada penelitian ini dengan memberikan kuesioner tentang aspek blended learning kepada 95 bidan yang bertugas di wilayah kerja Dinas Kesehatan Purwakarta. Analisis data bivariate dengan uji statistik Spearman menggunakan software* STATA *versi 15. Hasil penelitian ini diperoleh tidak terdapat hubungan antara aspek blended learning (pedagogical design, social design, ethnic design, different, option) dan karakteristik peserta diklat (usia, pendidikan, pekerjaan, masa kerja, pelatihan terakhir) dengan nilai r=0.00-0.20; p-value>0.005. Dengan demikian, aplikasi iPosyandu Bidan sebagai mobile Learning (mLearning) dapat berkontribusi dalam pembelajaran bagi peserta diklat menggunakan metode Blended Learning. Aplikasi iPosyandu bidan dapat digunakan oleh peserta diklat dengan berbagai usia, tingkat pendidikan, pekerjaan, dan masa kerja, serta pengalaman pelatihan.*

**ABSTRACT**

Education and Training (*Diklat*) with blended learning is training with learning carried out face to face directly and indirectly (synchronous and asynchronous). Asynchronous learning can use the iPosyandu application as a learning medium in professional training. However, success in the asynchronous learning process using the iPosyandu midwife application is related to the characteristics of the training participants. This research aims to analyze aspects of blended learning based on the characteristics of education and training (training) participants based on the iPosyandu Midwife Application. This research method used quasi-experimental with posttest design. Data were collected in this research by giving questionnaires about aspects of blended learning to 95 midwives with analysis of bivariate data with the Spearman statistical test using STATA version 15 software. This study showed no relationship between aspects of blended learning (pedagogical design, social design, ethnic design, different options) and the characteristics of training participants (age, education, occupation, period). work, last training) with a value of r=0.00-0.20; p-value>0.005. Thus, the iPosyandu Midwife application as mobile learning (mLearning) can contribute to learning for trainees using the Blended Learning method. iPosyandu midwife application can be used by trainees with various ages, education levels, occupations, and tenure, as well as training experience.



## 1. INTRODUCTION

The development of a country following the acceleration of globalization must be accompanied by an increase in human resources who are professional and competent in their fields (Mohamed et al., 2021; Simangunsong, 2023). Thus, the education system must change to become more modern to keep up with the rapid flow of globalization. Modernization of the education system is an indicator of national development. A modern education system needs to be accompanied by increased professional human resources to answer future educational challenges (Mohamed Hashim et al., 2022; Zhienbayeva et al., 2019). Professional human resources are produced from continuous education in the form of training as a lifelong learning process because it is an integral part of quality education (Gaitas & Alves Martins, 2017; Tufail & Farooq, 2021). The professional training program aims

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to help trainees understand the context and procedures for solving crucial and challenging problems in the workplace. With advances in technology in the form of computers and multimedia, many professional training programs have implemented technology to provide more learning materials. The technology used in blended learning training combines offline training and provides assignments to watch videos online so that it can improve performance. The practical implications of blended learning can facilitate training participants' learning to improve competency on an ongoing basis (Hinneburg et al., 2020; A. T. Noour & Hubbard, 2016).

Blended learning is a learning model that encourages training participants to collect information in the form of knowledge actively. The blended learning model combines conventional learning with e-learning because this learning is not limited by space, time, or distance. Blended learning combines synchronous and asynchronous learning. Training participants can learn anywhere and anytime with various media sources, so blended learning can motivate them to gain knowledge sources (Burhendi et al., 2020; Larasati & Rustandi, 2022). Blended learning training participants can learn through multimedia teaching materials, interact and practice with educators, and train participants in online and offline classrooms. However, Conventional Blended Learning (C-BL) presents teaching materials through online videos and offline classes. In a learning environment with one-way information transmission and no experience, it is not easy for most trainees to experience the situations encountered in the professional training process, affecting their assessment and performance (Abroto et al., 2021; Asih & Ramdhani, 2019; Zaneldin et al., 2019). The e-learning program has been established by the International Medical College (IMC) at the University of Duisburg-Essen on education and training (diklat) using blended learning (Joos et al., 2022; Widyasari et al., 2019). Blended learning combines online and offline learning experiences to help trainees learn through online Information and Communication Technology (ICT). The learning process becomes flexible, reducing attendance in crowded classrooms, and teaching and learning experiences are planned. The assessment prepares the benefits and challenges of learning (by trainees) and teaching (by faculty) in blended learning training with different online learning tools. The results of blended learning are helpful for schools, universities and professional training. Currently, the development of online and e-learning platforms is used in blended learning to improve the abilities of trainee students (Barton et al., 2022; Burhendi et al., 2020). Blended learning is widely considered an approach that combines face-to-face and online learning components. Therefore, a systematic literature review was conducted to identify challenges in the online component of blended learning from the perspective of trainees, teachers and educational institutions. Self-regulation challenges and challenges in using learning technology are the main challenges faced by training participants. The challenge for educators/resources in training lies mainly in using technology in teaching. The challenge of providing appropriate and effective learning technology is the main challenge faced by education and training (training) institutions. The review highlights the need for further research to address the challenges of trainees, instructors/resources and training institutions with blended learning (M. A. T. Noour & Hubbard, 2015; Rasheed et al., 2020).

The rapidly changing development of Information and Communication Technology (ICT) is called digital transformation in education and training, which answers the needs of trainees to facilitate the learning process to gain knowledge. With digital transformation, anyone can reach education anywhere and at any time in the future. Therefore, education in the future will be significantly influenced by ICT so trainees and teachers can interact and collaborate in unlimited knowledge (Prayogi, 2020; Shurygin et al., 2022). *Posyandu* has a very important role in maintaining the health of mothers and children, but the national survey indicated that 62.5 percent of households did not use *Posyandu* for reasons of lack of need (Ismarwati et al., 2022; Rinawan et al., 2021). Seeing the deterioration of *Posyandu* performance, the government saw the need to revitalize *Posyandu* for example by giving cadres consistent training so that cadres have science updates from training that are useful for their own families, neighborhood and could be beneficial to the state. However, the government has a constraint that training is usually provided over time and is not evenly distributed in each region due to limited regional resources or village conditions do not meet the criteria. Such training is usually self-organized by the local authorities. This makes the training provided non-exhaustive and non-exhaustive for all *Posyandu*. Therefore, the access of cadres to obtain training in a global era like this must be thought out by utilizing information technology so that cadres from all regions can access training anytime and anywhere. Training and informal education utilizing appropriate and sustainable technologies can be an alternative in the management of cadre empowerment (Lampropoulos et al., 2019; Nuzula et al., 2023). Technological advances in mobile applications (mHealth) are driving global transformation in health services because they are easy to access, affordable and effective in providing health services. mHealth can be used as continuous learning for health workers and health promotion for the community. One of the applications in Indonesia is the iPosyandu midwife application, which aims to facilitate the quality of verification data at *Posyandu* and monitoring of Maternal and Child Health (MCH) data, and is essential to meet the need to increase midwife competency, which is integrated with mobile health-based services which can make it easier for midwives to develop themselves according to the needs of the midwife profession (Gopalakrishnan et al., 2020; Susanti et al., 2022).

Based on the results of research conducted in Purwakarta Regency, it is clear that the components of the training curriculum are interrelated so that the iPosyandu application can be used as a training medium for all

competencies in training. Training participants can use the iPosyandu application as a learning medium that makes it easier to access training materials, thus saving training costs for midwives as participants and training organizers (Susanti et al., 2022; Zulianto et al., 2021). Midwife training with blended learning is carried out face to face and online using Zoom meetings, as well as using the iPosyandu application to access training e-modules, learning videos and evaluations to improve midwives' abilities in providing midwifery services (Cassum et al., 2020; Surtinah & Sunarto., 2021). *Posyandu* has a very important role in maintaining the health of mothers and children, but the national survey indicated that 62.5 percent of households did not use *Posyandu* for reasons of lack of need. Seeing the deterioration of *Posyandu* performance, the government saw the need to revitalize *Posyandu* for example by giving cadres consistent training so that cadres have science updates from training that are useful for their own families, neighborhood and could be beneficial to the state. However, the government has a constraint that training is usually provided over time and is not evenly distributed in each region due to limited regional resources or village conditions do not meet the criteria. Such training is usually self-organized by the local authorities. This makes the training provided non-exhaustive and non-exhaustive for all *Posyandu*. Therefore, the access of cadres to obtain training in a global era like this must be thought out by utilizing information technology so that cadres from all regions can access training anytime and anywhere. Training and informal education utilizing appropriate and sustainable technologies can be an alternative in the management of cadre empowerment (Brinia et al., 2023; Nuzula et al., 2023). Thus, this article aims to analyze aspects of blended learning based on the characteristics of education and training (training) participants based on the iPosyandu midwife application. The novelty of this study introduces the iPosyandu application, which is designed to support education and training for midwives through a blended learning approach. This application is an innovation that combines digital technology with conventional training methods, which have not been widely discussed in the context of health training, especially for midwives.

## 2. METHOD

The research method uses cross-sectional analytical methods. This research was carried out in the work area of the Purwakarta District Health Service by giving questionnaires to 95 village midwives in February 2023. Questionnaires regarding blended learning were given after the midwives received continuous midwifery care training. The questionnaire regarding blended learning is a Likert scale (1= strongly disagree, 2= agree, 3= unsure, 4= agree, 5= strongly agree). (citation of blended learning questionnaire). The blended learning questionnaire is based on the article Designing and Improving a Blended Synchronous Learning Environment: An Educational Design Research (Wang et al., 2017). The questionnaire was tested for validity with an $R_{value}$> 0.2787 ($R_{count}$> $R_{table}$) so that the 22 statement items were said to be valid. However, one statement item was invalid ($R_{count}$ <$R_{table}$), so the statement item was corrected and used for data retrieval. Meanwhile, the results of the reliability test show that the questionnaire is reliable, with a value of 0.8870 (>0.80-1.00).

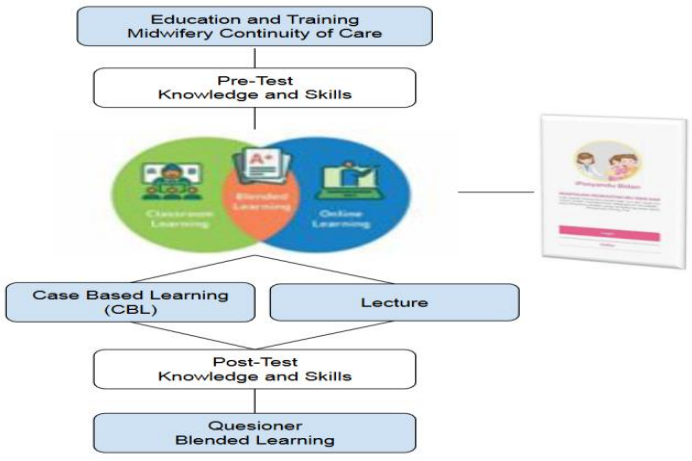


**Figure 1.** Blended Learning Training Procedure Based on the iPosyandu Midwife Application

This training is carried out in a blended learning manner with the case-based learning(CBL) method for skills carried out face to face and the lecture method for theory carried out online using Zoom meetings. However, training participants use the iPosyandu midwife application to access training materials through learning videos and e-modules for sustainable midwifery care training. Training evaluation is done by providing a pre-test and post-test regarding knowledge and skills. Univariate data analysis uses descriptive analysis, and bivariate data uses analytics with the Spearman statistical test. Univariate data analysis used descriptive analysis, and bivariate data

used the Spearman statistical test using STATA version 15 software. This research has received ethical permission from Universitas Padjadjaran No. 640/UN6.KEP/EC/2021.

## 3. RESULT AND DISCUSSION

### Result

**Table 1.** Characteristics of Education and Training Participants

| Characteristics | n (95) | % |
|---|---|---|
| **Age** | | |
| ≤35 years old | 47 | 49.47 |
| >35 years old | 48 | 50.53 |
| **Education Level** | | |
| D3 | 81 | 85.26 |
| D4/S1 | 10 | 10.53 |
| D4+Profesi | 4 | 4.21 |
| **Length of work** | | |
| ≤1-5 years | 9 | 9.47 |
| 6-10 years | 29 | 30.53 |
| >10 years | 57 | 60.00 |
| **Last Training** | | |
| ≤ 1 years | 6 | 6.32 |
| 2-3 years | 71 | 74.74 |
| > 3 years | 18 | 18.95 |
| **Demographics** | | |
| Rural | 58 | 61.05 |
| Urban | 37 | 38.95 |

Table 1 shows that the majority of training participants have the characteristics of age > 35 years (51.58%), D3 education level (85.26%), length of service (%), midwives who have had the last training for around 2-3 years (74.74%), and geographical location in the village (61.05%). The correlation between blended learning aspect and age is show in Table 2.

**Table 2.** Correlation between Blended Learning Aspects and Age

| Aspects of Blended Learning | Age (n=95) | | $r_{value}$ | $p_{value}$* |
|---|---|---|---|---|
| | ≤35 years old f (%) | >35 years old f (%) | | |
| Pedagogical Design | | | -0.074 | 0.479 |
| Social Design | | | -0.063 | 0.548 |
| Tehnic Design | 47 (49.47) | 48 (50.53) | -0.004 | 0.972 |
| Different | | | 0.067 | 0.522 |
| Option | | | -0.055 | 0.597 |

note:*Spearman

Table 2 shows that there is no correlation between the blended learning aspect and the age of the midwife (p-value>0.005, r=0.00-0.20) and the age of the midwife. Correlation between blended learning aspects and education is show in Table 3.

**Table 3.** Correlation Between Blended Learning Aspects and Education

| Aspects of Blended Learning | Education (n=95) | | | $r_{value}$ | $p_{value}$* |
|---|---|---|---|---|---|
| | D3 f (%) | D4/S1 f (%) | D4+Profesi f (%) | | |
| Pedagogical Design | | | | 0.163 | 0.11 |
| Social Design | | | | 0.205 | 0.046 |
| Tehnic Design | 81 (85.26) | 10 (10.53) | 4 (4.21) | 0.056 | 0.591 |
| Different | | | | 0.197 | 0.056 |
| Option | | | | 0.235 | 0.022 |

note:*Spearman

Table 3 shows that there is no correlation between aspects of blended learning and education (p-value>0.005, r=0.00-0.20). Correlation between blended learning aspects and work period is show in Table 4.

**Table 4.** Correlation between Blended Learning Aspects and Work Period

| Aspects of Blended Learning | Length Work (n=95) | | | $r_{value}$ | $p_{value}$ |
|---|---|---|---|---|---|
| | ≤1-5 years | 6-10 years | >10 years | | |
| | f (%) | f (%) | f (%) | | |
| Pedagogical Design | 9 (9.47) | 29 (30.53) | 57 (60.00) | 0.021 | 0.840 |
| Social Design | | | | 0.052 | 0.614 |
| Tehnic Design | | | | -0.036 | 0.731 |
| Different | | | | 0.053 | 0.611 |
| Option | | | | 0.036 | 0.727 |

Table 4 shows that there is no correlation between the blended learning aspect and work experience (p-value>0.005, r=0.00-0.20). Correlation between blended learning aspects and last training is show in Table 5.

**Table 5.** Correlation between Blended Learning Aspects and Last Training

| Aspects of Blended Learning | Training (n=95) | | | $r_{value}$ | $p_{value}$ |
|---|---|---|---|---|---|
| | ≤ 1 years | 2-3 years | >3 years | | |
| | f (%) | f (%) | f (%) | | |
| Pedagogical Design | 6 (6.32) | 71 (74.74) | 18 (18.95) | -0.023 | 0.810 |
| Social Design | | | | -0.052 | 0.615 |
| Tehnic Design | | | | 0.001 | 0.989 |
| Different | | | | -0.020 | 0.845 |
| Option | | | | -0.069 | 0.501 |

Table 5 shows that there is no correlation between the blended learning aspect and the last training (p-value>0.005, r=0.00-0.20). Relationship between blended learning aspects and demographics is show in Table 6. Table 6. shows that there is no relationship between the blended learning aspect and residence (p-value>0.005).

**Table 6.** Relationship between Blended Learning Aspects and Demographics

| Aspects of Blended Learning | Demographics (n=95) | | $r_{value}$ | $p_{value}$ |
|---|---|---|---|---|
| | Urban | Rural | | |
| | f (%) | f (%) | | |
| Pedagogical Design | 58 (61.05) | 37 (38.95) | -0.033 | 0.748 |
| Social Design | | | -0.139 | 0.179 |
| Tehnic Design | | | -0.056 | 0.590 |
| Different | | | -0.014 | 0.887 |
| Option | | | -0.019 | 0.849 |

**Discussion**

Improving the quality of human resources can be done through training. Currently, the blended learning model is the most widely used approach to increase the quantity and quality of training. The blended learning training model combines approaches with face-to-face and online training. With the blended learning model, the implementation of training becomes more flexible, making it easier for participants to access theory and training materials. It can also increase participants' learning motivation and independence, making the class more effective. The blended learning model can be applied as a training model in educational and training institutions. Adequate information technology infrastructure and participant independence are needed to improve the quality of blended learning during sessions (Akhmadi et al., 2021; Winarni et al., 2022). E-learning as a learning tool used in blended learning has many advantages as technology develops. Individual characteristics influence a person's acceptance and willingness to use technology in new information/technology systems . Individual characteristics according to the results of this study in Table 1 show that midwives as training participants have the characteristics of the majority with age > 35 years (51.58%), D3 education level (85.26%), length of service (%), midwives taking the last training approx. 2-3 years (74.74%), and geographical location in the village (61.05%). The results of this research are supported by research conducted in Kuala Lumpur, Malaysia, that shows differences in students' readiness for blended learning based on gender, age, ethnicity, and field of study (Adamsn et al., 2021).

Age is closely related to maturity, which is the result of a person's stages of growth and development, which shape each person's personality little by little. Maturity level based on age is a person's readiness for maturation (Kusumawardhani et al., 2020). Most of the training participants in this study were > 35 years old, so they already had mature personalities. This study's results show no correlation between the blended learning aspect and the age and length of service of training participants (p-value>0.005, r=0.00-0.20). Thus, training participants of various ages can attend blended learning training based on the iPosyandu application. However, this study's results differ from those of research conducted in Daerah Khusus Ibukota (DKI) Jakarta, where there is a relationship between age and motivation and the performance of blended learning training participants (Haerani, 2021).

Blended learning in training has become a profitable teaching approach in adult education because it can create various learning opportunities (M. A. T. Noour & Hubbard, 2015; Winarni et al., 2022). However, no research results reveal that blended learning contributes to education and training in society. Factors that support blended learning consist of information and guidance processes. Information is negatively related to social participation, while process guidance positively determines social participation. Additionally, transfer and peer support were positively related to social participation. Training participants' knowledge increases if instructors can facilitate peer support during blended learning to achieve positive changes in social participation (Cocquyt et al., 2019; Saleh, 2021). Support between peers can provide positive feedback to each other as motivation in carrying out the blended learning process. Blended learning is widely known for its ability to enhance learning. However, little is known about designing effective blended learning environments supporting immersive learning, such as more excellent learning experiences and accessibility to education and training. The results of the literature review show that cognitive factors are pedagogical principles related to four abilities in using technology-based learning tools: time, individual, learning task, and learning environment. These factors are helpful for instructors to plan learning and teaching by selecting technological learning tools that are appropriate to the proper education 4.0 pedagogy to optimize immersive, blended learning practices (Araka et al., 2021; Bizami et al., 2023). The blended learning model can be applied as one of the training models in educational institutions. To optimize blended learning in training, it is necessary to support adequate information technology infrastructure and participant independence (Akhmadi et al., 2021; Angiolini et al., 2020). So is in Ethiopia stated that the skills possessed by training participants with undergraduate education were higher than those with diploma education in conventional training compared to blended learning. Thus, training costs for blended learning are lower than for conventional learning. The results of research conducted in Ethiopia stated that the skills possessed by training participants with undergraduate education were higher than those with diploma education in conventional training compared to blended learning. Thus, training costs for blended learning are lower than for conventional learning. Blended learning using mobile phones in the form of applications is as effective as conventional approaches in increasing service providers' knowledge at a much lower cost (Huang et al., 2022; Yigzaw et al., 2019). The results of this research are not in line with the results of this study (table 3.), which shows that there is no correlation between the blended learning aspect and the level of education (p-value>0.005, r=0.00-0.20).

Blended learning is considered effective in initiating constructivist learning experiences for training participants by integrating face-to-face approaches with online technology. Community of Inquiry (CoI) combines teaching, social, and cognitive presence to explore trainees' blended learning experiences from the perspectives of collaboration, critical thinking, and knowledge construction. The research results on the General English Course show that teaching, social, and cognitive presence are correlated and that social and cognitive presence have a high correlation (Zhang, 2008). The learning process in blended learning includes material, discussions, workshops, online and offline guidance, and a final presentation. Training participants' learning progress can be monitored, and feedback on the results of their work can be given (Christianto, 2019; Surahman et al., 2019). Blended learning training is expected to improve and make optimal use of technology in the form of the internet in learning development and help educators to teach better in the learning process according to learning styles and preferences (Lestyoningsih & Hidayati, 2020; Williams, U. J., & Dries, 2022). This is in accordance with the results of this research, which show no correlation between the blended learning aspect and the last training attended (p-value>0.005, r=0.00-0.20). Training participants prefer to use online learning models in class compared to other learning models, such as Zoom, Google Meet, and WhatsApp call. Trainees can learn comfortably and at their own pace and study repeatedly (Alenezi, 2020; Setyaningrum, 2020). Table 6 shows that there is no relationship between the blended learning aspect and residence (village or city) (p-value>0.005). This research aligns with the results of research conducted in Saudi Arabia, which found no difference between training participants' perceptions of blended learning based on demographic factors.

Using online and direct face-to-face learning in blended learning training can build communication and interaction between training participants and instructors (Dridi et al., 2020; Prestiadi et al., 2020). In addition, in previous research stated that, blended learning provides satisfaction to training participants because training participants can solve problems independently in analyzing and synthesizing information (Kardosod et al., 2023). In addition, training participants can concentrate more on learning, thereby increasing training participants'

motivation to acquire new knowledge and build self-confidence. With blended learning, training participants can remember and integrate previously acquired knowledge during the training process. A systematic review by other study explains that online learning, like actual classes, can help trainees acquire clinical practice skills that are similar to actual practice (Kaewsaeng-on et al., 2021). Online learning allows trainees to learn from trial and error until they master the necessary skills, increasing their confidence in their abilities.

In addition, independent learning can improve the problem solving and time management skills of trainees so that learning objectives in the training are achieved. Bended learning provides a teaching and learning experience in the learning process by using flexible information and communication technology. Blended learning has been implemented at the University of Petroleum and Energy Studies, India, and Jaypee Institute of Information Technology, Noida, India. Blended learning is beneficial for schools, universities, and professional training because it can improve learners' abilities. The implications of this research can contribute to improving the effectiveness of learning for training participants. By understanding the characteristics of participants, the development of the Blended Learning program can be adjusted to achieve better learning outcomes; besides that, it can open opportunities for collaboration with relevant stakeholders, such as Training and Training organizers, iPosyandu Midwife application providers, and educational institutions. This could lead to further development initiatives or more in-depth research.

Limitations of this study the individual characteristics of training participants can vary greatly. Research can be difficult to consider all the variability of individuals, such as technology skill level, educational background, and learning style, that can affect learning outcomes. Provide optimal instructional support, including guides, tutorials, and guidance, to ensure that training participants can take full advantage of Blended Learning resources. This can help overcome any technical or conceptual barriers participants may face. Provide optimal instructional support, including guides, tutorials, and guidance, to ensure that training participants can take full advantage of Blended Learning resources. This can help overcome any technical or conceptual barriers participants may face.

## 4. CONCLUSION

It is concluded that there is no relationship between the aspects of blended learning (pedagogical design, social design, ethnic design, different, option) and the characteristics of trainees (age, education, occupation, tenure, last training). Thus, iPosyandu application-based blended learning can be used by trainees of various ages, education levels, occupations, and tenures, as well as training experience.

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