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An Analysis of Curriculum Development for Doctoral Program of Educational Technology with Graduates' Work Experiences

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ABSTRAK

Abstract: This study aimed to analyze the responses of Educational Technology graduates to the curriculum development of the educational technology doctoral program used at the State University of Malang. This research used descriptive analysis techniques using statistics and data visualization. The research subjects were 78 respondents, who had work experience start from under five years until over 20. This study found that graduates of the doctor of educational technology program tend to consider (1) Quality of graduates; (2) The needs of the world of work; (3) Vision and Mission of the curriculum; (4) The number of tuition fees. This study's findings are useful for improving the university's strategy to produce doctoral program graduates who can compete and answer the challenges of the industrial revolution 4.0.

Abstrak: Penelitian ini bertujuan untuk menganalisis tanggapan lulusan Teknologi Pendidikan terhadap pengembangan kurikulum program doktor teknologi pendidikan yang digunakan di Universitas Negeri Malang. Penelitian ini menggunakan teknik analisis deskriptif dengan menggunakan statistik dan visualisasi data. Subjek penelitian berjumlah 78 responden, yang memiliki pengalaman kerja mulai dari usia di bawah lima tahun hingga di atas 20 tahun. Hasil penelitian ini menemukan bahwa lulusan program doktor teknologi pendidikan cenderung mempertimbangkan (1) Kualitas lulusan; (2) Kebutuhan dunia kerja; (3) Visi dan Misi kurikulum; (4) Jumlah biaya kuliah. Temuan penelitian ini berguna untuk meningkatkan strategi universitas untuk menghasilkan lulusan program doktor yang mampu bersaing dan menjawab tantangan revolusi industri 4.0

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Changes from time to time guide educational practices to align education with the times' needs and developments. Efforts to align education implementation are translated into curriculum reforms to create competent and knowledgeable human resources. Curriculum renewal needs to be synchronized with the times, science and technology knowledge, development of students and community of activists, and demands for quality improvement from the government. In terms of harmonizing the times, curriculum renewal adapts to the community's needs to achieve the desired educational goals, especially education in tertiary institutions, especially the educational technology doctoral program. Doctoral program curriculum renewal needs to be done to meet market demand and society's increasingly dynamic development. They are synchronizing educational practices in higher education with the global community's need to focus on the sustainability of human life and economic welfare by transforming knowledge and learning into collaborative curriculum innovations (Tassone et al., 2018).

The renewal of the curriculum in the educational technology doctoral program needs to align with the development of science, information, and communication technology to produce doctoral candidates with knowledgeable human resources, competent pedagogy, facilitate the learning environment, develop and implement a learning environment by utilizing technology to support teaching and learning activities, and improving performance through a series of activities exploring, evaluating, synthesizing, applying the method of investigation in research (AECT, 2012). The development of information and communication technology provides opportunities for doctoral programs to work in the knowledge industry sector, which requires trained human resources in a globally competitive business environment (Shin et al., 2018). In line with that, the field of work refers to students' ability to apply their fields of expertise and optimize the use of technology in solving various problems faced and adapt themselves to the work environment (Suwandi, 2014). Furthermore, curriculum renewal needs to pay attention to students who lead doctoral students to gain increased competence in knowledge, skills, attitudes, and values related

to their future profession through learning experiences. Learning experiences are substantial in bridging doctoral students in developing professional cognitive, affective, and psychomotor competencies in the same or different fields (Jung, 2018; Lin & Chiu, 2014; Pull et al., 2016).

Also, educational technology activists have contributed to curriculum renewal by perfecting objectives, operationalizing concepts, and measuring various phenomena with a methodological basis of thinking based on various literature sources and relevant concept studies as innovation in education implementation in doctoral educational technology. The educational technology curriculum develops and the many empirical findings of educational technology practitioners (Kumar & Antonenko, 2014). The curriculum plays an important role in increasing competent human resources to encourage national development. In this case, the government's demands for improving education quality have also become the basis for increasing education implementation through curriculum reform. Of course, this is in line with the issuance of Law of the Republic of Indonesia No. 12 of 2012 concerning tertiary institutions as stipulated in article 29 paragraphs 1, 2, and 3 concerning the Indonesian National Qualifications Framework, which reads "The Indonesian National Qualifications Framework is a gap in learning outcomes that equalizes outcomes in formal, non-formal education, or work experience in the framework of competency recognition. Work by the structure of work in various sectors which in this case becomes the primary reference in determining the competence of graduates in academic education, vocational education, and professional education which in determining graduate competencies is determined by the Minister of Education and Culture of the Republic of Indonesia (Undang-Undang Republik Indonesia, 2012).

The curriculum in its implementation has systematic components that must be prepared in the curriculum's formation, including the curriculum's vision and mission, which is to show and ensure the uniqueness and ideals or goals of an educational program can be appropriately achieved (Azis et al., 2017). Second, the goals, namely the process of formulating curriculum goals based on the underlying philosophy. Third, the graduate profile describes a graduate's character or the expected construction when students complete the entire learning process with qualifications for the Indonesian National Qualifications Framework, including attitudes, value values for abilities, knowledge, and rights responsibilities. Fourth, the standard of graduate learning outcomes, namely the minimum abilities a graduate must have based on the graduate profile's qualifications or the minimum abilities expected of a student after participating in a series of learning experiences by the graduate profile qualifications. Fifth, study materials, namely materials needed to build and compile the expected learning outcomes or materials compiled based on the standard of graduate learning outcomes and supporting science, manifested in courses. Course distribution is the determination of courses based on the competency analysis of graduates and study materials. Furthermore, curriculum assessment and evaluation are finally based on gathering information to assess and implement a program. The components of the higher education curriculum are prepared by determining and determining the vision and mission, objectives, graduate profiles, graduate learning achievement standards, study materials, course distribution, and assessment and evaluation (Direktorat Jenderal Pendidikan Tinggi Kementerian Pendidikan dan Kebudayaan, 2014; Hussain et al., 2011; Ilie, 2013; Khodijah, Febriyanti, Annur, & Haitami, 2016).

The curriculum renewal procedure is carried out in various stages, including the *Forum Group Discussion* (FGD), which is implemented into an internal discussion between the curriculum development team, including the research team, the curriculum development team at the university, and the faculty level. FGD is a group discussion activity that discusses a subject under the guidance of a moderator where the results of the analysis of the subject are concluded from a series of dialogue results and interactions that occur during discussion activities (Sim & Waterfield, 2019). Needs analysis with stakeholders as a process in obtaining information to meet the needs of curriculum renewal, which includes the need for competencies or skills to be achieved, synchronizing the curriculum with the times, and evaluation. Implementation in fulfilling the 21st-century curriculum competency needs analysis in the national curriculum policy requires various stakeholders such as education policymakers, leaders of educational institutions, educational researchers, and educators (Voogt & Roblin, 2012). Formulation of a curriculum draft to describe and conclude a needs analysis in curriculum development. The curriculum draft is a conceptual framework that is constructed. Curriculum strengthening, review, and curriculum finalization are the final stages in the curriculum renewal stage (Hussain et al., 2011; Ilie, 2013).

This research is expected to contribute to various groups including: first, for graduates of the educational technology doctoral program to contribute as a long-term program in fulfilling the development of the education industry (learning industry), science, technology, and arts, as well as developments in the era of revolution industry 4.0 and welcome the era of society 5.0. For students of the doctoral program, educational technology contributes to measuring personal abilities and achieving the expected competencies through learning experiences. The institution's benefit is contributing as constructive input to improve the quality of education and a solution to educational problems that exist from time to time. Meanwhile, graduates' benefits contribute as a reference source in curriculum development for doctoral programs, especially for educational technology doctoral programs. The stakeholders contribute as an empirical foundation in the development of the doctoral level curriculum.

METHODS

This study uses descriptive analysis techniques using statistical analysis with IBM SPSS Statistics 24 and data visualization with orange data mining software. The research subjects were 78 respondents consisting of 23 women and 55 men, where each respondent has a history of work experience, as shown in table 1.

Table 1. Number of Respondents Based on Work Experience

Gender	Work Experiences		
	<5 Years	>20 Years	5—20 Years
Female	10	3	10
Male	26	16	13
Grand Total	36	19	23

The selected respondents are graduates of the educational technology doctoral program, State University of Malang. The reason for choosing these respondents is that respondents have proficiency at work after they graduate from the doctoral program and have work experience based on the need for the doctoral educational technology curriculum to compete in the era of the industrial revolution 4.0.

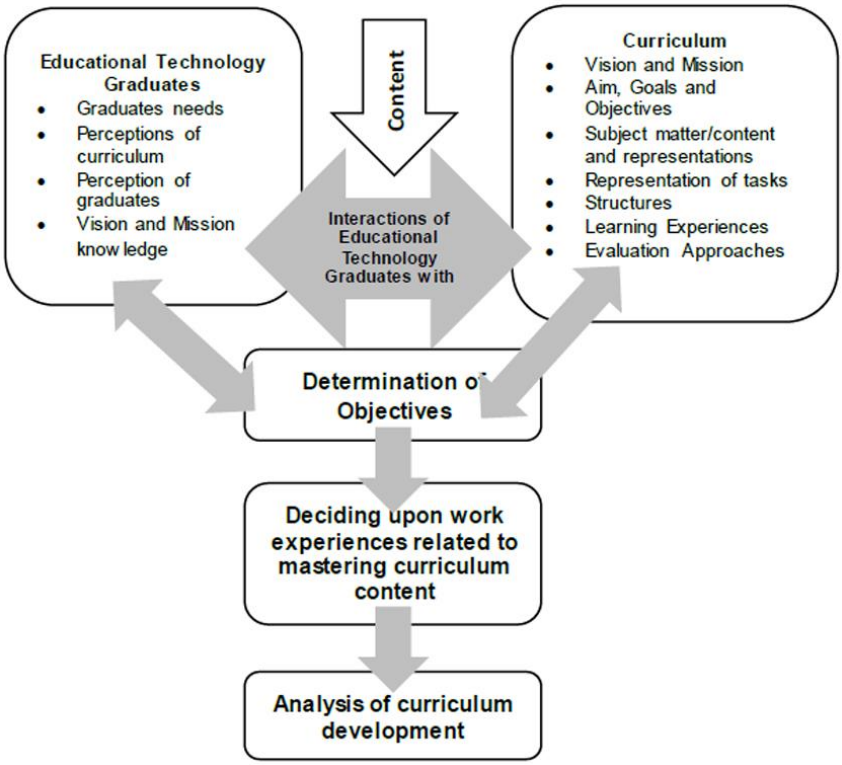

Figure 1. The Analysis Stage of the Educational Technology Doctoral Program Curriculum

Figure 1 shows the stages of curriculum analysis consisting of four (4) stages: content development based on educational technology graduates' interaction with the curriculum, determining curriculum development goals, deciding work experience related to mastering curriculum content, and analyzing curriculum development. The developed curriculum contains the vision and mission, goals, and objectives of curriculum development, curriculum structure, and evaluation approaches. The curriculum content is arranged based on the results of information collected from doctoral program graduates, while the assessment parameters for curriculum development are shown in table 2.

Table 2. Curriculum Development Survey

Category	Item No.	Item Description
Vision and Mission	Q1	The vision and mission of the curriculum can help achieve quality graduates
Work Productivity	Q2	Competence/achievement of graduates in the curriculum can create graduates who have high work productivity
Graduates Performance	Q3	The course presented in the curriculum can create a graduates performance that meets the expectations of user institutions
Loyalty	Q4	The course presented in the curriculum can create graduates who have high loyalty
Work commitment	Q5	The learning process in the curriculum can create graduates who have a high work commitment
Needs of the world of work	Q6	The vision and mission of t he curriculum are by the socio-cultural and technological developments and the needs of the world of work
Needs Of The Field	Q7	Competencies/achievements of graduates in the curriculum are by the needs of the field
Courses Subject	Q8	The courses are by the needs of the field
Socio-Cultural and Technological Developments	Q9	Course presentation is by the socio-cultural and technological developments
Knowledge	Q10	Course offerings equip graduates to work professionally in their respective fields of knowledge
Government Policy	Q11	Course presentation is by government policy
Quality Of Graduates	Q12	Course presentation can create quality graduates according to field needs
Student's Study Period	Q13	Course presentations assignments including a thesis/dissertation, and the learning process are efficient to the student's study period
Student Study Costs	Q14	Course presentations, assignments including a thesis/dissertation, and the learning process are efficient to student study costs
Learning Outcomes	Q15	Course presentations, assignments including a thesis/dissertation, and the learning process have been effective in helping students achieve their profile/learning has been effective in helping students achieve the predefined profiles/competencies/learning outcomes
The Vision and Mission Achievement	Q16	Course presentations assignments including a thesis/dissertation, and the learning process have been effective in achieving the vision and mission of the study program
The Learning Process	Q17	Profile of graduates/competencies/learning outcomes, course presentations, assignments including a thesis/dissertation, and the learning process includes assignments including a thesis/dissertation, and the learning process is flexible with changes in society
Science and Technology	Q18	Profile of graduates/competencies/learning outcomes, course presentations, thesis/dissertation, and the learning process is flexible with assignments including changes in science and technology in each study program
Flexibility Process	Q19	Profile of graduates/competencies/learning outcomes, course presentations, assignments including a thesis/dissertation, and the learning process is flexible with the time, needs, and educational background of students
Continuity	Q20	Profile of graduates/competencies/learning outcomes, course presentations, assignments including a thesis/dissertation, and the learning process has been able to survive (continuous) with changes in society and science and technology in each study program

A 20 item survey was carried out to 78 graduates of the educational technology doctoral program, where they were asked to report their perceptions of curriculum development parameters. The questionnaire was developed based on a curriculum that has been implemented in the doctoral program at the State University of Malang. The questionnaire examined the perceptions of graduates of the doctoral program who have worked for a period of work divided into 3, namely <5 years, 5—20 years, and> 20 years. Table 2 shows the sections and items of the questionnaire used to obtain data. Respondents reported their perceptions on a 5-point Likert scale, where one indicates “strongly disagree,” and five indicates “strongly agree.” This study has limitations that need to be considered; namely, respondents with a service period of> 20 years are very few. The limit in question is the distribution of the number of respondents. Another limitation is that some responses to industrial revolution 4.0 for doctoral graduates in educational technology are still low. Some respondents may give different perceptions to others even though the numbers are small.

RESULT

Distribution of Respondent

The data collection of this research involved as many as 78 respondents, where the respondents consisted of 29% (23) of the respondents were women and 71% (55) of the respondents were male. 46% (36) of respondents had work experience under five years, 29% (23) of respondents had work experience between 5 and 20 years, and 24% (19) of respondents had work experience over 20 years.

Table 3. Distribution of Work Experiences Respondent

Gender	Work Experiences		
	<5 Years	>20 Years	5—20 Years
Female	10	3	10
Male	26	16	13
Grand Total	36	19	23
%	46%	24%	29%

The respondents' distribution can be analyzed using data visualization to show trends in work experience data towards gender. Data visualization shows that most male respondents have work experience under five years, while female respondents have an even distribution of work experience under five years and work experience between 5 and 20 years. The distribution of respondents using the data visualization analysis approach can be seen in Figure 2.

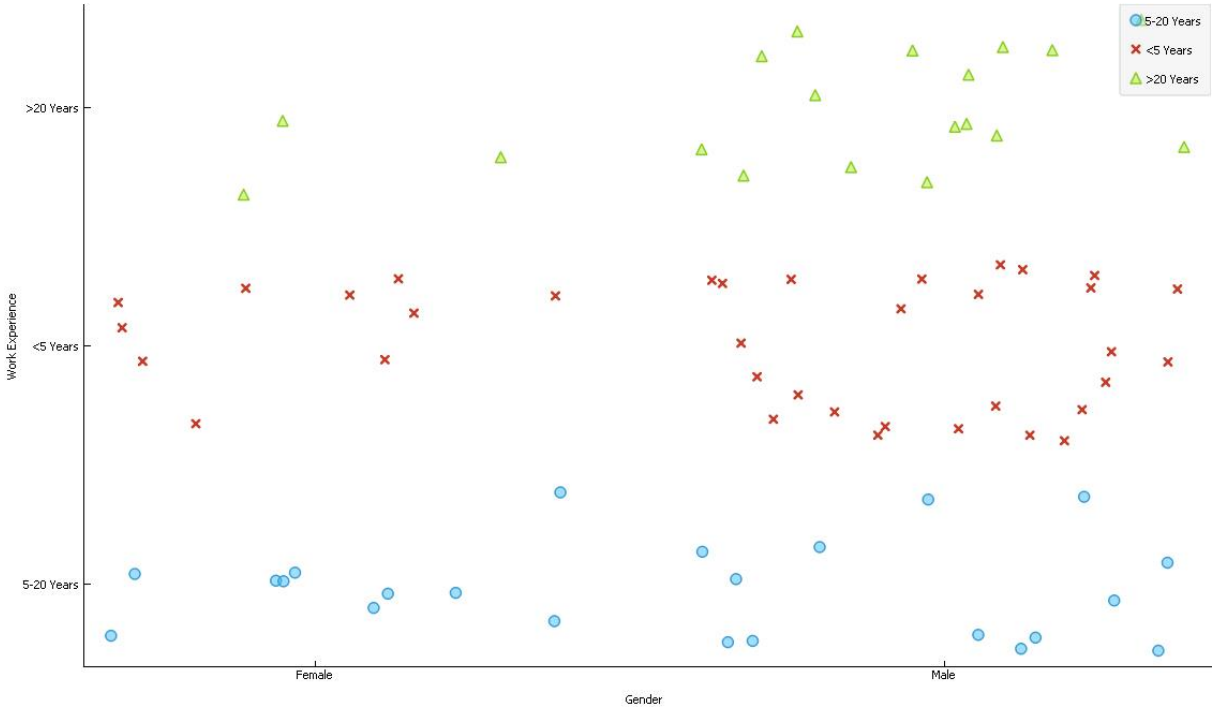

Figure 2. Data Visualization from The Respondent's Work Experience

Analysis of Curriculum Development

The average score for the 20 items in the item analysis can be seen in Table 4. Based on table 4. It can be seen that Q18 (Profile of graduates/competencies/learning outcomes, course presentations, thesis/dissertation, and the learning process is flexible with assignments including changes in science and technology in each study program) which discusses the relationship between "Science and Technology" and the curriculum obtains the highest Mean ($\bar{X}$) value of 4.68. Based on this, most educational technology doctoral program graduates consider the link between "Science and Technology" and curriculum development. The second consideration is that graduates of educational technology doctors choose the relationship between "Vision and Mission" (Q1) and "Loyalty" (Q4). The choice of these two question items has a Mean ($\bar{X}$) value of 4.67. Q1 (The vision and mission of the curriculum can help achieve quality graduates) is considered by graduates of the doctoral program as an option because they consider that the vision and mission are essential to determine the goals and direction of curriculum development. Meanwhile, Q4 (The course presented in the curriculum can create graduates who have high loyalty) is chosen by doctoral graduates because they think that curriculum development is expected to increase graduates' loyalty to the institutions where they work. The next choice is Q14 (Course presentations, assignments including a thesis/dissertation, and the learning process are efficient to student study costs), graduates of the doctoral program consider education costs as the 4th largest choice because they are related to considerations of costs that must be incurred during the learning process beginning to the end.

Table 4. Means for Curriculum Development Items

Item	Mean	Std. Deviation
Q1	4.67	.501
Q2	4.63	.512
Q3	4.62	.540
Q4	4.67	.550
Q5	4.58	.523
Q6	4.50	.598
Q7	4.55	.617
Q8	4.38	.608
Q9	4.33	.550
Q10	4.55	.638
Q11	4.54	.618
Q12	4.44	.636
Q13	4.33	.696
Q14	4.64	.534
Q15	4.40	.589
Q16	4.46	.658
Q17	4.40	.610
Q18	4.68	.522
Q19	4.50	.575
Q20	4.26	.495

Graduates of the educational technology doctoral program select items based on a Likert scale. Item Q1 ($\bar{X}$ = 4.67, SD = 0.501) shows that 24 respondents stated "Agree" on the relationship of "Vision and Mission" to the development of the doctoral program curriculum. Meanwhile, 53 respondents stated, "Strongly Agree," and one respondent stated, "Neither Agree Nor Disagree" on the relationship between "Vision and Mission." While Item Q2 ($\bar{X}$ = 4.63, SD = 0.512) shows that 27 respondents stated "Agree" on the relationship of "Work Productivity" to the development of the doctoral program curriculum. Fifty respondents stated "Strongly Agree," and one respondent stated "Neither Agree Nor Disagree" on the relationship of "Work Productivity" to the development of the doctoral program curriculum, as in table 5.

Table 5. Distribution of Choices on Questionnaire Items

Likert Item	Item No.									
	Q1	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Q8**	**Q9**	**Q10**
Agree	24	27	26	20	31	31	25	38	46	23
Disagree			2							
Neither Agree Nor Disagree	1	1		3	1	4	5	5	3	6
Strongly Agree	53	50	50	55	46	43	48	35	29	49
Likert Item	**Item No.**									
	Q11	**Q12**	**Q13**	**Q14**	**Q15**	**Q16**	**Q17**	**Q18**	**Q19**	**Q20**
Agree	26	35	32	24	39	28	37	21	33	54
Disagree		1								
Neither Agree Nor Disagree	5	3	10	2	4	7	5	2	3	2
Strongly Agree	47	39	36	52	35	43	36	55	42	22

Table 5 shows the distribution of choices on the questionnaire items where each item (Q) has a different choice distribution depending on each doctoral program graduate's perceptions. Item Q3 ($\bar{X}$ = 4.62, SD = 0.540) (The course presented in the curriculum can create a graduates performance that meets the expectations of user institutions) shows 26 respondents stated "Agree," 2 respondents stated "Neither Agree Nor Disagree," and 50 respondents stated "Strongly Agree" on the relationship between Graduates Performance and curriculum development. Meanwhile, item Q4 ($\bar{X}$ = 4.67, SD = 0.550) (The course presented in the curriculum can create graduates who have high loyalty) shows that 20 respondents stated “Agree” regarding the relationship of “Loyalty” with the development of a doctoral program curriculum. This choice agrees with 50 respondents who stated "Strongly Agree," while three respondents said, "Neither Agree Nor Disagree."

Item Q5 ($\bar{X}$ = 4.58, SD = 0.523), which states the link between "Work commitment" and curriculum development, 31 respondents stated "Agree," 1 respondent stated "Neither Agree Nor Disagree," and 46 respondents stated, "Strongly Agree." This result is that doctoral program graduates' perception is that commitment to work is closely related to industry 4.0. Therefore, curriculum development is necessary to discuss this. Whereas in Q6 ($\bar{X}$ = 4.50, SD = 0.598), which states the relationship "Needs of the world of work" in education with curriculum development, 31 respondents stated "Agree," 4

respondents stated "Neither Agree Nor Disagree," and 43 respondents declared "Strongly Agree." Respondents in item Q6 consider that graduates respond that the curriculum needs in the doctoral program must be adaptive to the development of the industrial revolution 4.0.

The mean score of the respondents on several items was statistically different. Item Q7 ($\bar{X}$ = 4.55, SD = 0.617) (Competencies/achievements of graduates in the curriculum are by the needs of the field) were 25 respondents stated "Agree," 5 respondents stated "Neither Agree Nor Disagree," and 48 respondents declared "Strongly Agree." Q8 ($\bar{X}$ = 4.38, SD = 0.608) (The courses are by the needs of the field) were 38 respondents stated "Agree," 5 respondents stated "Neither Agree Nor Disagree," and 35 respondents stated, "Strongly Agree." In item Q8, doctoral program graduates consider the needs of the educational technology field for Industry 4.0.

Item Q9 ($\bar{X}$ = 4.33, SD = 0.550) (Course presentation is by the socio-cultural and technological developments), 46 respondents stated "Agree," 3 respondents stated "Neither Agree Nor Disagree," and 29 respondents stated, "Strongly Agree." In this session, most of the graduates agreed that curriculum development must be socio-cultural and technological. Item Q10 ($\bar{X}$ = 4.55, SD = 0.638), which discusses the relationship between knowledge and curriculum development, 23 respondents stated "Agree," 6 respondents stated "Neither Agree Nor Disagree," and 49 respondents stated, "Strongly Agree." The category of "knowledge" referred to in this discussion is that most of the respondents stated that they strongly agreed with the relationship between curriculum development that took into account the development of knowledge. Therefore, the development of science can impact doctoral graduates' readiness in educational technology to face the challenges of the industrial revolution 4.0.

Doctoral graduates gave the relationship between Government Policy and curriculum development (Q11) ($\bar{X}$ = 4.54, SD = 0.618) responses, 26 respondents stated "Agree," 5 respondents stated "Neither Agree Nor Disagree," and 47 respondents stated, "Strongly Agree." Item Q12 ($\bar{X}$ = 4.44, SD = 0.636), which discusses the relationship between graduate quality and curriculum development, 35 respondents stated "Agree," 3 respondents stated "Neither Agree Nor Disagree," 39 respondents stated "Strongly Agree," and 1 respondent stated, "Disagree." This result is different from other items because respondents stated "Disagree" on the relationship between graduates' quality and curriculum development, although respondents stated that this was not significant. Item Q13 ($\bar{X}$ = 4.33, SD = 0.696), obtained 32 respondents stated "Agree", 10 respondents stated "Neither Agree Nor Disagree" and 36 respondents stated "Strongly Agree". Q13 discusses the relationship between the Student's Study Period and the educational technology doctoral program curriculum development. As a result of item Q13, many respondents chose "Neither Agree Nor Disagree". This result is related to the length of study time, so some graduates doubt whether curriculum development can cut their study time while taking the doctoral program because of the large number of requirements completed during the study. Q14 ($\bar{X}$ = 4.64, SD = 0.534), which discusses the relationship between Student Study Costs and curriculum development, 24 respondents stated "Agree," 2 respondents stated "Neither Agree Nor Disagree," and 52 respondents stated, "Strongly Agree".

The results of the further questionnaire are explained as follows, item Q15 ($\bar{X}$ = 4.40, SD = 0.589) discusses the relationship between Learning Outcomes to obtain results, 39 respondents stated "Agree", 4 respondents stated "Neither Agree Nor Disagree" and 36 respondents stated, "Strongly Agree". Item Q16 ($\bar{X}$ = 4.46, SD = 0.658) discusses the relationship between The Vision and Mission Achievement, getting results, 28 respondents stated "Agree", 7 respondents stated "Neither Agree Nor Disagree" and 43 respondents stated, "Strongly Agree". Item Q17 ($\bar{X}$ = 4.40, SD = 0.610) discusses the relationship between The Learning Process to get results, 37 respondents stated "Agree", 5 respondents stated "Neither Agree Nor Disagree" and 36 respondents stated, "Strongly Agree". Whereas item Q18 ($\bar{X}$ = 4.68, SD = 0.522) discusses the relationship between Science and Technology, the results are 21 respondents stated "Agree", 2 respondents stated "Neither Agree Nor Disagree" and 52 respondents stated, "Strongly Agree". Item Q19 ($\bar{X}$ = 4.68, SD = 0.522) which discusses the relationship between the Flexibility Process and curriculum development obtained 33 respondents who stated "Agree", 3 respondents stated "Neither Agree Nor Disagree" and 42 respondents stated, "Strongly Agree". Whereas in the last item Q20 ($\bar{X}$ = 4.26, SD = 0.495) which states the relationship between the Continuity of learning process and curriculum development, 54 respondents stated "Agree", 2 respondents stated "Neither Agree Nor Disagree" and 22 respondents stated, "Strongly Agree". Q20 obtained the lowest Mean value ($\bar{X}$ = 4.26) because most respondents need to consider several reasons for the learning process's continuity. After all, this is closely related to the length of time studying.

Validity of Instrument

The instrument items' validity process is needed to measure the accuracy of the variables to be studied. A questionnaire is declared a valid instrument if the instrument can measure and describe the variables to be studied accurately and precisely. Validity shows the level of feasibility of an instrument, where the higher the validity of a questionnaire item, the questionnaire is suitable to be used as a tool to collect data. This study uses the Corrected item-total Correlation technique to measure the validity of the instrument. Before measuring the instrument's validity, it is necessary to determine the instrument's reliability as shown in table 6.

Table 6. Reliabilitas Instrument

Reliability Statistics	
Cronbach's Alpha	N of Items
0.921	20

Table 6 shows information about the items' reliability as a whole where the Cronbach's Alpha value is obtained at 0.921. The value of Cronbach's Alpha, 0.921> 0.70, so it can be concluded that the instrument items as a whole are reliable. These results refer to Cortina's (1993) research, which states that an instrument is declared reliable if the value of Cronbach's Alpha is> 0.70.

The next process is to determine the questionnaire items' validity by taking into account the Corrected item-total Correlation value in Table 7. Corrected Item-Total Correlation can be referred to as the r_{count} value, where based on this value the basis for decision making in the validity test is drawn: (1) If r_{count} value> r_{table} product-moment, then the questionnaire items meet the validity requirements. (2) if the r_{count} value <r_{table} product-moment, then the questionnaire items do not meet the validity requirements. The product-moment r_{table} value for Df = N of items - 2 = 78-2 = 0.1876.

Table 7. Validity of Instrument

Item-Total Statistics				
	Scale Mean if Item Deleted	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
Q1	85.45	48.484	.739	.914
Q2	85.49	49.162	.622	.916
Q3	85.50	48.383	.695	.915
Q4	85.45	49.134	.578	.917
Q5	85.54	50.693	.394	.921
Q6	85.62	47.253	.765	.913
Q7	85.56	48.119	.631	.916
Q8	85.73	48.303	.618	.916
Q9	85.78	48.978	.599	.916
Q10	85.56	49.262	.472	.919
Q11	85.58	48.351	.601	.916
Q12	85.68	46.948	.750	.913
Q13	85.78	48.588	.497	.919
Q14	85.47	48.279	.719	.914
Q15	85.72	50.153	.407	.921
Q16	85.65	47.892	.611	.916
Q17	85.72	49.530	.465	.920
Q18	85.44	50.483	.423	.920
Q19	85.62	48.292	.659	.915
Q20	85.86	50.590	.435	.920

Table 7 shows that the overall value of Corrected Item-Total Correlation (Q1 - Q20)> 0.1876, then the items (Q1 - Q20) are declared to meet the valid criteria. In detail, the Corrected Item-Total Correlation values are stated as follows: Q1 (0.739> 0.1876), Q2 (0.622> 0.1876), Q3 (0.695> 0.1876), Q4 (0.578> 0.1876), Q5 (0.394> 0.1876), Q6 (0.765> 0.1876), Q7 (0.631> 0.1876), Q8 (0.618> 0.1876), Q9 (0.599> 0.1876), and Q10 (0.472> 0.1876). In the items Q1-Q10, some results show the lowest Corrected Item-Total Correlation value compared to the overall value, namely at Q5. Item Q5 (The curriculum's learning process can create graduates with a high work commitment), Corrected Item-Total Correlation = 0.394, which states the relationship between work commitment and curriculum change. The low value of validity on item Q5 ($\bar{X}$= 4.58, SD = 0.523) is caused by respondents who think that knowing a commitment to work takes a long time and other factors affect work commitment work experience. Meanwhile, on the items Q1- Q10, it was found that the Corrected Item-Total Correlation value was the highest compared to the overall value, namely at Q6. Item Q5 (The vision and mission of the curriculum are by the socio-cultural and technological developments and the needs of the world of work), Corrected Item-Total Correlation = 0.765, which states the relationship between vision - mission and Needs of the world of work with the development of the educational technology doctoral program curriculum. The high validity value of item Q6 ($\bar{X}$= 4.50, SD = 0.598) is caused by respondents who think that the doctoral program curriculum must prepare doctoral program students who can compete and have skills that match the needs of the world of work. Also, item Q1 (The vision and mission of the curriculum can help achieve quality graduates) has a high validity value, Corrected Item-Total Correlation = 0.739. The validity value of Q1 is caused by respondents who think that the vision and mission determine the direction, goals, and success of the learning process.

The next items are Q11 - Q20, where the Corrected Item-Total Correlation values are stated as follows: Q11 (0.601> 0.1876), Q12 (0.750> 0.1876), Q13 (0.497> 0.1876), Q14 (0.719> 0.1876), Q15 (0.407> 0.1876), Q16 (0.611> 0.1876), Q17 (0.465> 0.1876), Q18 (0.423> 0.1876), Q19 (0.659> 0.1876), and Q20 (0.435> 0.1876). In the items Q11-Q20, some results

show the Corrected Item-Total Correlation value that can be considered because it has a high value, although it is not the highest value, namely in Q12. Item Q12 (Course presentation can create quality graduates according to field needs), Corrected Item -Total Correlation = 0.750, which states the relationship between graduate quality and curriculum development in educational technology doctoral program. The validity value of Q12 is indirectly influenced by the relationship between the quality of graduates and the respondents' perceptions of the Q6 item which states the relationship between vision and mission to the needs of the world of work. Also, item Q14 (Course presentations, assignments including a thesis/dissertation, and the learning process are efficient to student study costs), Corrected Item -Total Correlation = 0.719, respondents considered the criteria for tuition fees as one of the important things in the process of curriculum development.

CONCLUSIONS

The curriculum is a series of systematically planned learning experiences marked by predetermined goals and objectives as a process of growth and actualizing students through a series of learning experiences (Gosper & Ifenthaler, 2014). Based on the results of data presentation, which are then reviewed, evaluated, and described based on the distribution of 20 question items given to 78 respondents through a poll using a google form, a discussion is obtained by referring to several main points that are the main basis for updating the curriculum for the doctoral program in educational technology, University of Malang. The results of this study indicate that the criteria that can be considered for developing the curriculum for the Doctoral Program in Educational technology are (1) The vision and mission of the curriculum are by the socio-cultural and technological developments and the needs of the world of work; (2) Course presentation can create quality graduates according to field needs; (3) The vision and mission of the curriculum can help achieve quality graduates; and (4) Course presentations, assignments including a thesis/dissertation, and the learning process are efficient to student study costs. The results of this study agree with the results of the research conducted by Saunders-Smits and de Graaff (2012) in his research which discusses the quality of the curriculum based on research conducted by alumni, which states that graduates of a study program contribute to improving the quality of the curriculum on a larger scale. Also, the curriculum determines the competence of graduates of a study program. Subsequent research was carried out by Osei et al. (2015), which states that the content of the curriculum content is relevant to graduates' work and supports increased work performance after studying.

The contents of the curriculum for the doctoral program of educational technology study programs that have been successfully updated include the need for synchronization with the philosophy of life-based learning, technology disruption, industrial learning, 21st-century necessary skills, local wisdom, noble character, and competencies, and capabilities in the era of industrial revolution 4.0 and the era of society 5.0. The curriculum design stages need to pay attention to the noble values of Indonesian culture and the output of the learning experience so that it can improve student achievement that is in line with the 2012 version of the AECT paradigm, such as knowledge, pedagogy, a facilitating learning environment, skills development, and professionalism, as well as improved performance and learning. (AECT, 2012). The 21st-century generation of learners is very different from the previous generation. The competencies and capabilities of the 21st-century generation must master more basic skills, which consist of searching for critical thinking, creative problem solving, collaborative activities, and communication (4Cs). In that case, educational technology doctoral graduates must ultimately have the capability to design and facilitate learning based on these 21st-century necessary abilities. Moreover, in the era of ICT-based science and technology development, doctoral graduates must be capable of developing cutting-edge digital-based learning designs and models, technology disruption, seamless learning, ubiquitous learning, and problem-based learning design models, project-based learning, and inquiry. / Research-Based Learning.

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