

국가 인재통계 혁신 전략과 과제

- 일 시: 2009년 12월 4일 오후 1:30 ~ 5:30
- 장 소: 양재 엘타워 엘가든
- 주 최: 한국교육개발원·인재통계협력망

프로그램

13:30~14:00	등록	
14:00~14:20	개 회 사 인사말씀 : 김태완(한국교육개발원장)	사회 : 강성국(한국교육개발원)
14:20~14:50	기조발표 국가 인재통계의 혁신 전략 김창환/ 한국교육개발원	
14:50~15:00	휴식	
15:00~16:30	주제발표 ■ 창의적 인재육성을 위한 통계의 현황과 과제 김영철/ 한국교육정책연구원 ■ 글로벌 인재육성을 위한 통계의 현황과 과제 정기오/ 한국교원대학교 ■ 과학기술 인재육성을 위한 통계의 현황과 과제 이정재/ 한국과학기술기획평가원	
16:30~16:40	휴식	
16:40~17:30	종합토론 및 정리 ■ 김영애/ 한국교육학술정보원 ■ 박상현/ 한국고용정보원 ■ 양창준/ 한국정보통신산업협회 ■ 전기택/ 한국여성정책연구원	사회 : 김창환(한국교육개발원)

목 차

C·o·n·t·e·n·t·s

국가 인재통계의 혁신 전략

1.	.....	3
2.	.....	4
3.	.....	10
4.	.....	27
5.	.....	38
6.	.....	53

창의적 인재통계의 발전과제

1 .	.....	63
I .	.....	63
II .	()	75
III .	.....	78
2 .	.....	86
I .	.....	86
II .	.....	91
III .	.....	94

글로벌 인재육성을 위한 통계의 현황과 과제

I .	.....	107
II .	국가통계 목적의 글로벌 인재 개념	112
III .	글로벌 인재 개념의 조작화와 조사방법론의 문제	126

목 차

C·o·n·t·e·n·t·s

IV. 글로벌 인재 통계데이터의 현황과 문제점	129
---------------------------------	-----

V. 글로벌 시대의 인적자원 인적자산 인적자본 통계	142
------------------------------------	-----

과학기술인재육성을 위한 통계의 현황과 과제

1.	163
2. 용어 정립 : 인력(통계) vs 인재(통계)	163
3. 기존 관련 연구들	164
4. 과학기술인력정책 관련 주요 방향	165
5. 과학기술인력의 범위와 규모	167
6. 국외 과학기술인력관련 통계 현황	170
7. 국내 과학기술인력관련 통계 현황	178
8. 국내 과학기술인력 관련 통계현황 분석 및 개선방향	184
9. 맺음말	189

국가 인재통계의 혁신 전략

김 창 환
(한국교육개발원)





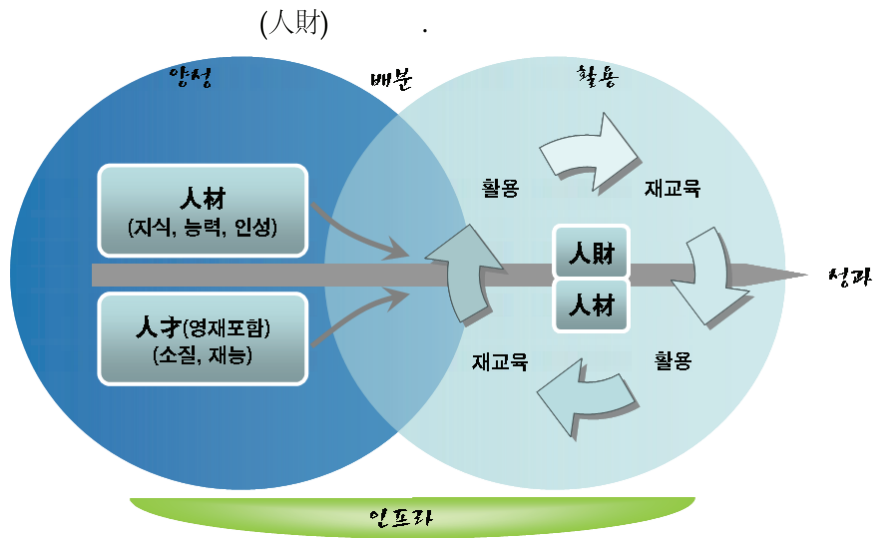
MB

1)

(, 2008b, 22)

(人材) . (人材)

(人才) .



〔그림 1〕 인재 개념 모형

: (2008b). p. 37.

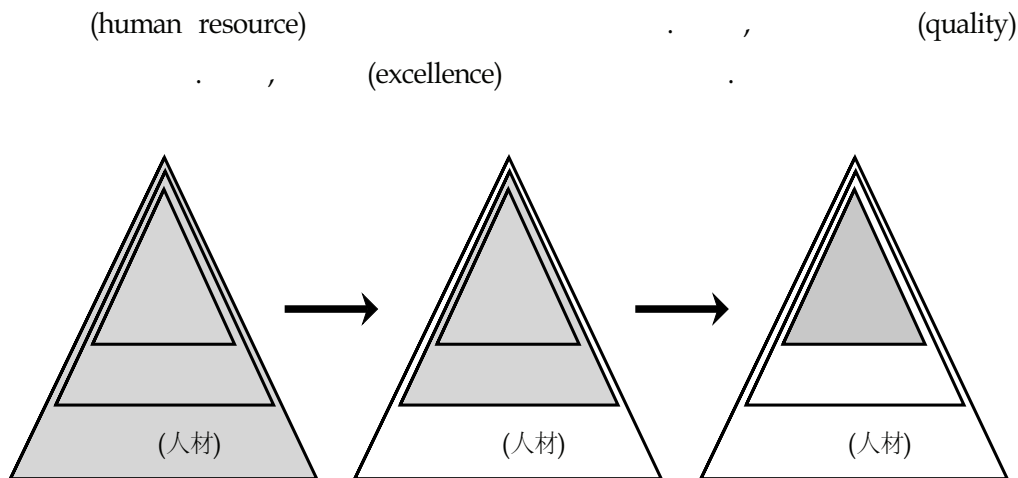
(人材)

(人材)

(人才)

(人財)

2)



〔그림 2〕 인재의 속성

3)

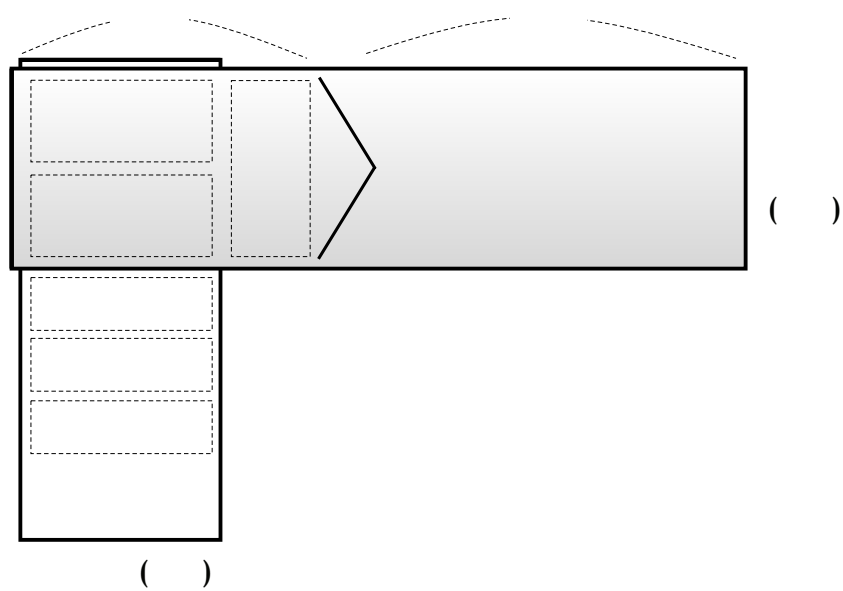
(flow) (stock)

(, 2008a).

(Data Collection) (Data Dissemination)

1) / (Data Collection)

()



[그림 3] 인재통계와 교육통계

· [3] ,
 (,) , , ,
 ·
 · ,
 , ,

2) (Data Dissemination)

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(to-be) .

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(,

2008).

〈표 1〉 영유아 단계의 인재양성 지표

		GDP	F	
		1	F	
			F	
			F	
			F	/
			F	/
	1		F	/
			F	/
			F	
			S	
			S	
			S	
			F	/
			S	/
			F	
			F	

〈표 2〉 아동 및 청소년단계 인재양성 지표

			S	
			S	
		()	S	/
		GDP	F	/
		OECD GDP (2003)	F	/
		1	F	/
		OECD 1 (2003)	F	/
		1	F	/
			F	/
		OECD (2002)	F	
			F	
			S	
			S	
		1	F	/
		1 (2004)	F	/
			S	/
		OECD (2004)	F	/
			F	
			F	

		1	S	
		1	S	
		·	S	/
		· ()	S	
		· 1	F	
			S	
		1	F	
			S	
		(2004)	F	
		(2004)	F	
		IMD	F	
		OECD (PISA)	F	
		PISA	F	
		IEA (TIMSS)	F	
		TIMSS (2003)	F	

〈표 3〉 고등교육 단계 인재양성 지표

			S	
			S	
		10	S	
			F	
			F	
			S	/
			S	/
			F	
			F	
		R&D	F	
			F	
			F	
			F	
			F	
			F	
			F	
			F	
			S	
			S	
		GDP	F	/
			F	
			F	
			S	
			S	
			S	
			S	
		SCI	F	/
		SCI	F	/
			F	
		IMD	F	
		IMD	F	

			S	
		10	S	
			S	
			S	
			S	
			S	
			S	
			S	
			S	
			S	
		The Times	F	
			F	
			S	
			S	

〈표 4〉 평생교육 단계에서의 인재양성 지표

			F	
			F	
			F	
			F	
			F	
			F	
		(, ,)	S	
		(, ,)	S	
			S	
			S	
		()	S	
		()	S	
		()	S	/
		()	S	
			F	
			F	
			S	
			F	
			F	/
		, - 1	F	
			F	
			F	/
			F	
			F	

(, 2008).

〈표 5〉 학교에서 노동시장으로 이행 지표

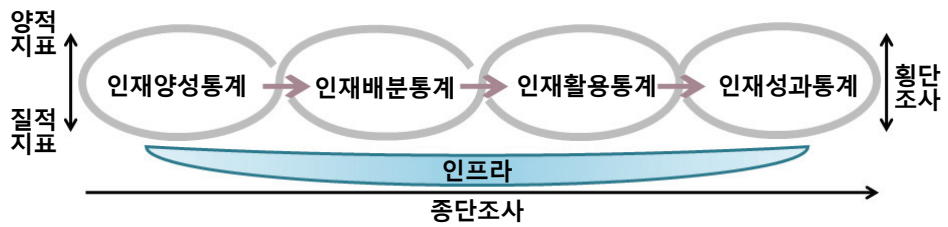
' → '			S	
			S	
			F	
			S	
			S	
			S	
			S	
			S	
			S	
			S	
			S	
			F	
			F	
			S	
			S	
			S	
			S	
			S	
			F	
			F	
			S	
			S	
			S	
			F	

〈표 7〉 인재활용 지표

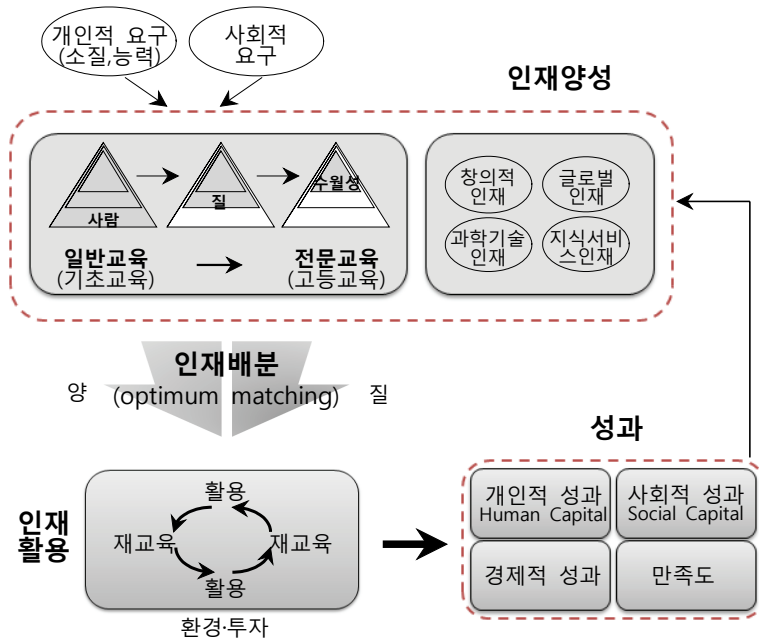
			S	
		, ,	S	
			S	
		, ,	S	
			F	
			F	
			F	
			F	
			S	
			S	
			S	
			S	
			S	
		, ,	S	
			S	
			S	
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			F	
			F	

(, 2008).

〈표 8〉 인재성과 지표				
			F	
			F	/
			F	
			F	
		10	F	/
			F	
			F	
			F	
			F	
		()	F	
			F	
			F	
			F	
	()		S/F	
			F	
			F	/
			S/F	
			F	/
		1	F	/
			F	/
			S/F	
			F	
			F	
		SCI	F	/
		WEF	F	
		ODA	F	



[그림 4] 내용체제 모형



[그림 5] 인재통계내용체제 모형

(人材)

(matching)

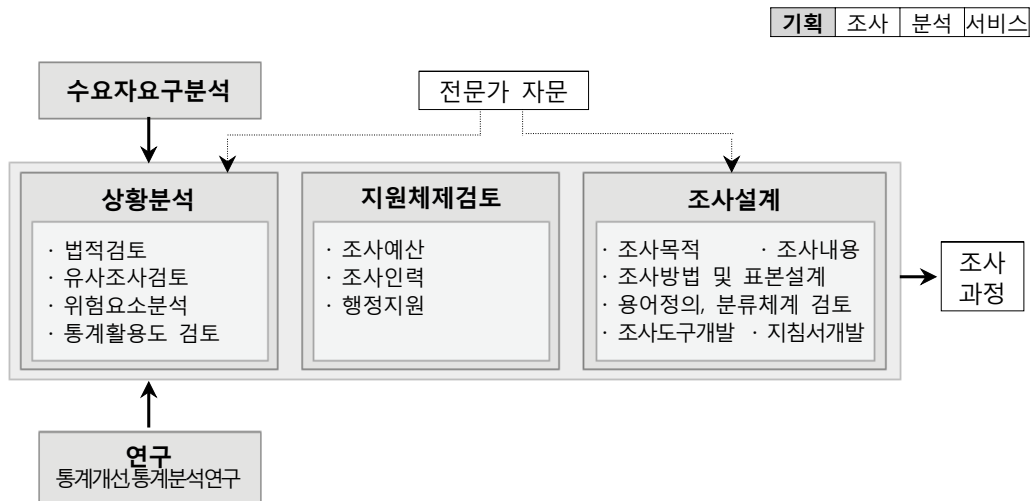
(Process

innovation)

(, 2006). (Statistics Planning), (Data Collection), (Data Analysis), (Data Dissemination) .

1)

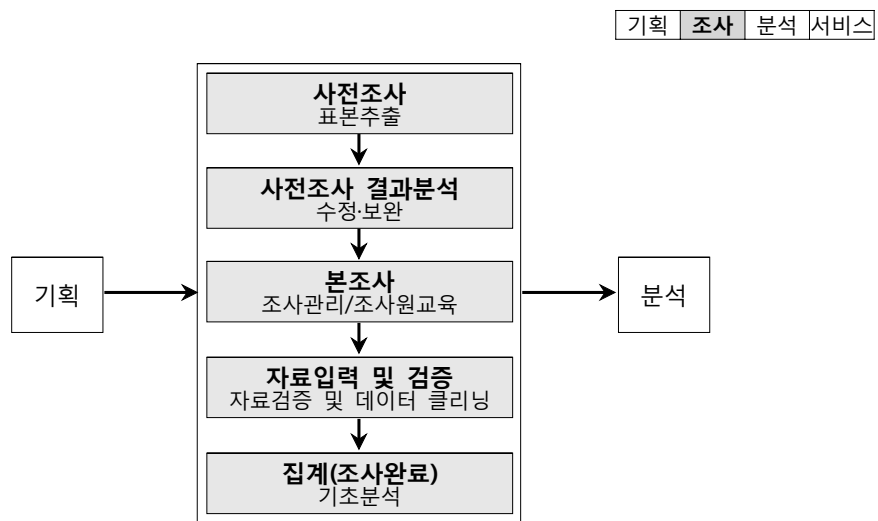
(UN, 1999).



[그림 6] 통계기획과정

2)

(Statistics Finland, 2007).



〔그림 7〕 인재통계 조사모형

3)

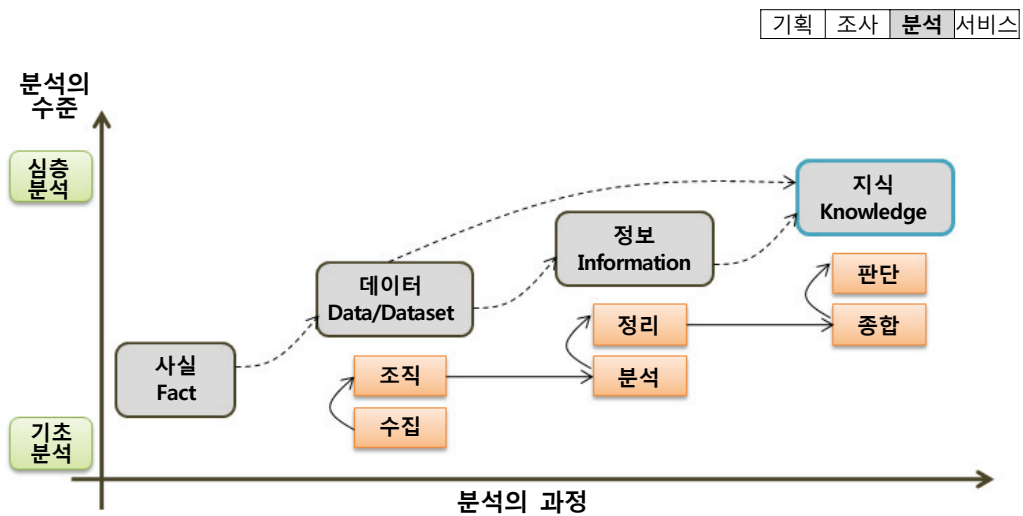
(data) (fact)

(information)

(context)

(knowledge)

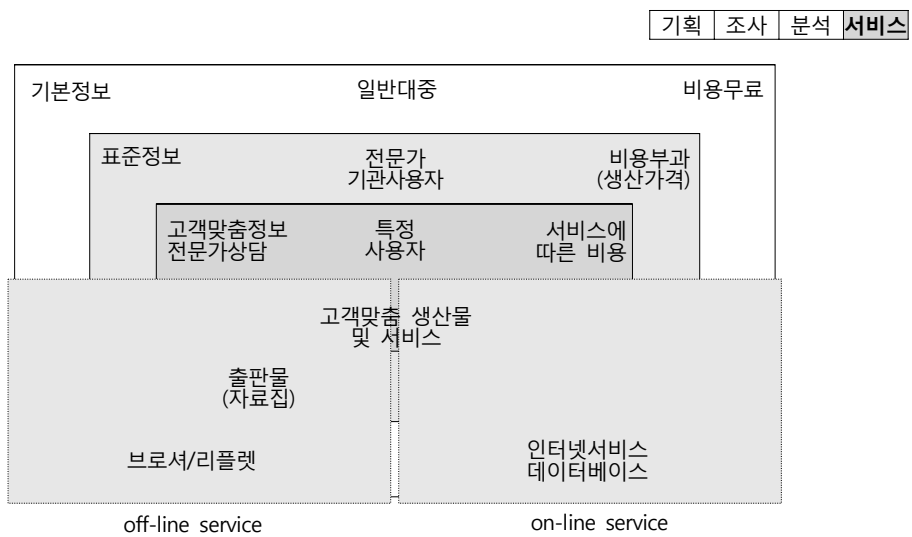
(Mandinach, 2008).



[그림 8] 인재통계 분석 모형

4)

[9]

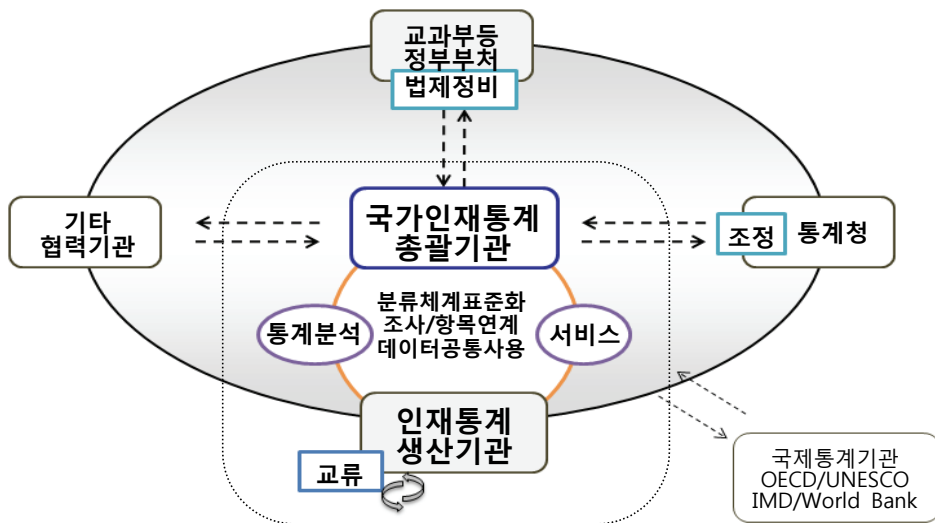


[그림 9] 인재통계 서비스 모형



(2005)

(2006)



〔그림 11〕 인재통계 관리·지원체제 모형

DB

DB

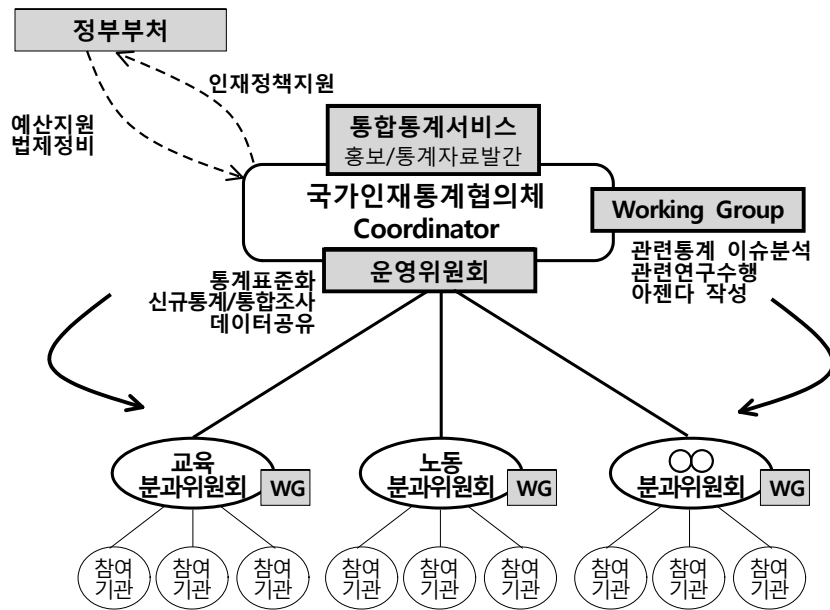
(),

DB

(

DB,

working group



[그림 12] 협력연계모형



(, 2006).

MB

5

〈표 9〉 인적자원개발정책과 인재정책의 비교

	/	/
	.	
		.
	/	/
	.	()

(2008).

(, 2008b, 155)

(data-based research)

(evidence-based policy making)

2008
 (2004)
 (84.8%)
 (61.2%) (97.4%)
 44.2%, 1 20.8%, 1 20.0%
 1
 57
 (47.5%), 33 (27.5%), 16
 (13.3%), ()
 14 (11.7%)
 40%
 , 39.2%

, 18.3%

55%,

16.7%,

17.5%,

7.5%

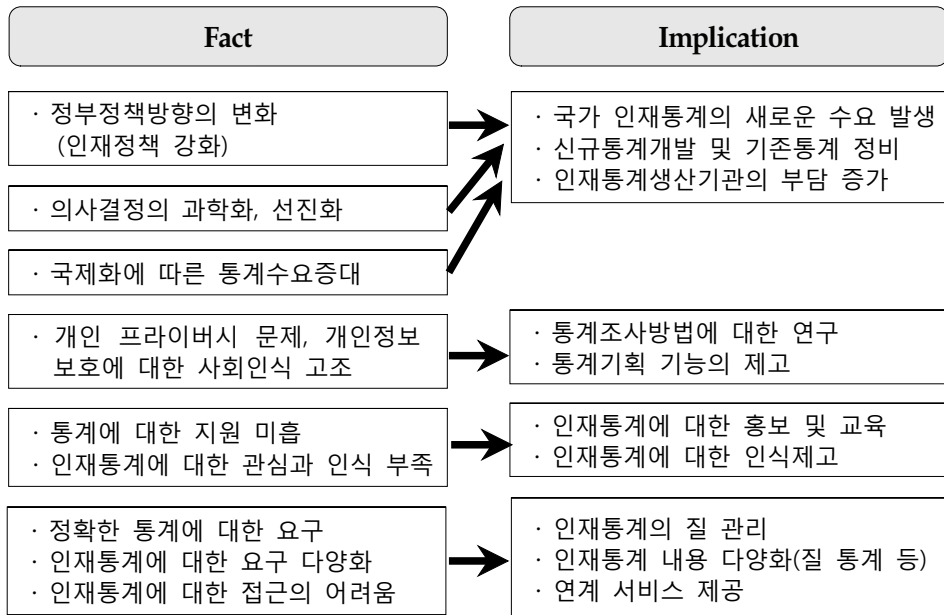
〈표 10〉 인재통계 수요자 요구분석 결과

	45(37.5)	70(58.3)	3(2.5)	2(1.7)	120
	1	1	1	1	
	24(20.0)	53(44.2)	18(15.0)	25(20.8)	120
	/				
	57(47.5)	33(27.5)	16(13.3)	14 (11.7)	120
	47(39.5)	48(40.3)	22(18.5)	2(1.7)	119
	4(3.3)	34(28.3)	71(59.2)	11(9.2)	120
	66(56.9)	20(17.2)	21(18.1)	9(7.8)	116

* 2008

(I)

1



(그림 13) 외부환경분석 결과

DB

()

IT

()

2008a).

Service System)

MDSS(Micro Data

NCES

FRSS(Fast Response Survey System)

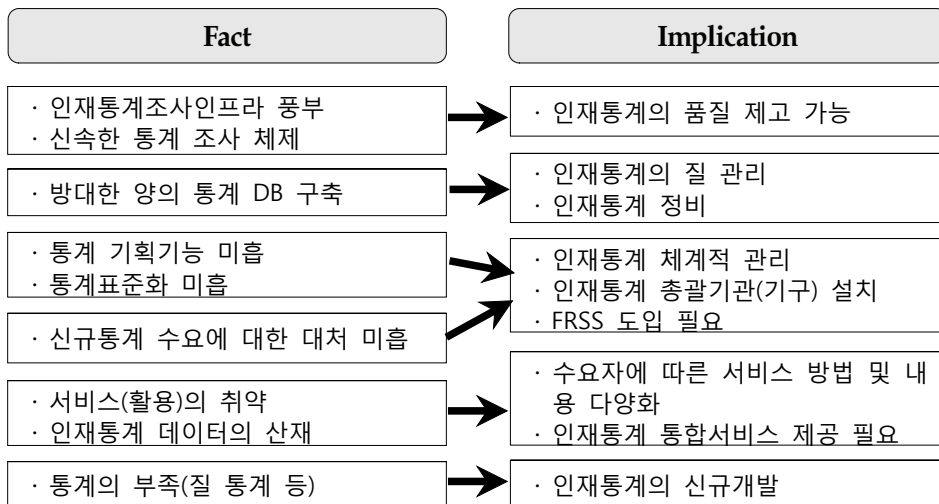
2

(, 2006a).

, 2008a)

DB

()



[그림 14] 내부역량분석 결과

. SWOT

SWOT		SWOT	
(Strength),	(Weakness),	(Opportunity),	(Threat)
(Opportunity)	(Threat)	(Strength)	(Weakness)
SWOT	< IV-3>		

〈표 11〉 인재통계 SWOT 분석 결과

Internal Focus	
S (strengths) what do well do? ○ ○ ○ DB	W (weakness) what is wrong now? ○ ○ ○ ○ ○
O (opportunities) what possibilities exist? ○ ○ ○ ○	T (threats) what can go wrong? ○ ○ ○ ○
external Focus	

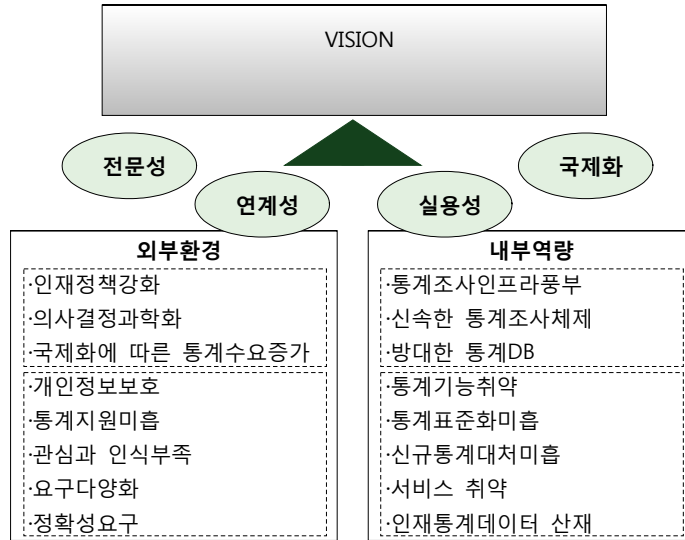
FRSS(Fast Response Survey System)



SWOT

1)

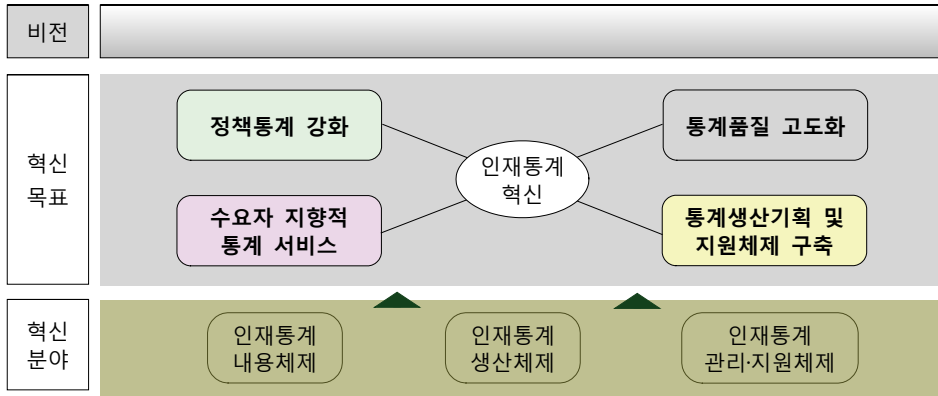
2008 16
(, 2008).



〔그림 15〕 인재통계 혁신 비전

2)

(goal)



[그림 16] 비전과 혁신목표

SWOT 분석을 통해, FRSS, DB, ST전략, WT전략, SO전략, WO전략, T(threats), O(opportunities), S(strengths), W(weakness) 등을 분석하고, 이를 바탕으로 인재통계 혁신 전략을 수립한다.

〈표 12〉 SWOT분석에 따른 인재통계 전략

	S(strengths) ◦ ◦ ◦ DB	W(weakness) ◦ ◦ ◦ ◦ ◦
O(opportunities) ◦ ◦ ◦ ◦	SO전략 FRSS	WO전략 .
T(threats) ◦ ◦ ◦ ◦ ◦	ST전략	WT전략 .

10

. 10

〈표 13〉 전략목표후보에 대한 전문가 의견조사 결과

	(/7)	(%)	(%)
	<u>6.23</u>	<u>15.67</u>	7.43
	5.90	3.67	<u>12.64</u>
	5.83	5.00	8.92
FRSS	5.90	3.67	<u>12.64</u>
	5.87	<u>10.67</u>	<u>14.87</u>
	<u>6.43</u>	<u>23.67</u>	7.43
	5.80	7.00	<u>13.75</u>
	5.97	<u>10.33</u>	<u>10.04</u>
	<u>6.13</u>	6.67	8.55
	<u>6.07</u>	9.00	<u>11.52</u>

, 7 10

· , ,

, ,

· 10

10

23.67%

(15.67%),

(10.67%),

(10.33%)

(14.87%),

(13.75%),

(12.64%),

(11.52%)

·

· , ,

<

V-3>

·

〈표 14〉 인재통계 혁신목표에 따른 전략목표

(3)	(4)	(10)
		FRSS

(Social Capital),

, FRSS(Fast Response Survey System)

ISO 9000

1)

〈표 15〉 인재통계 생산기획 및 지원체제 구축을 위한 전략목표

1.	
2.	
3.	()

1 :

2)

()

〈표 16〉 인재정책 통계 강화를 위한 전략목표

4.	
5.	

4 :

mismatch) (skill

5 :

OECD

, OECD
(, UN)

. OECD, IMD, WEF

OECD, UNESCO

(

)

「

」

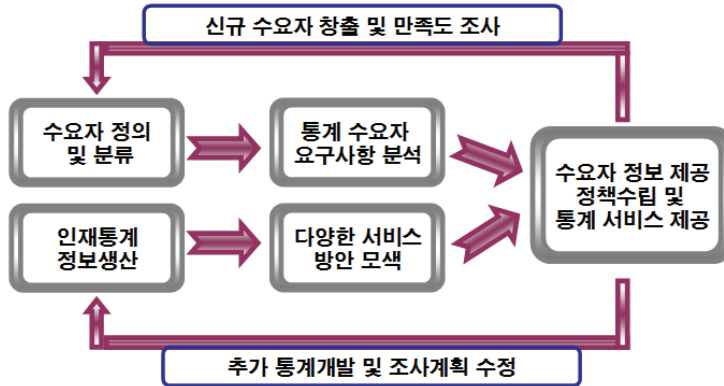
OECD, IMD, WEF

3)

〈표 17〉 수요자 지향적 통계 서비스를 위한 전략목표

6.	
7. FRSS	KFRSS
8.	
	One-stop

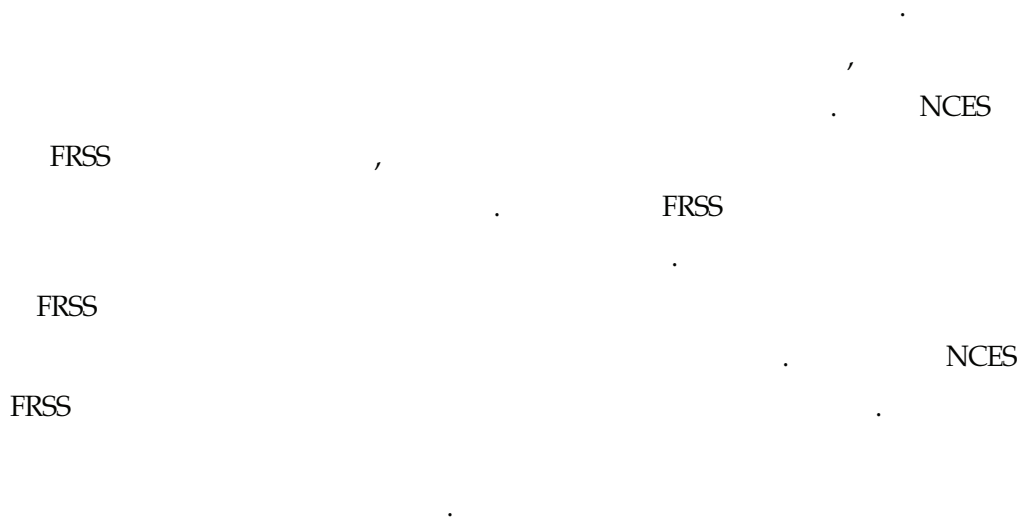
6 :



[그림 17] 수요자 유형별 맞춤형 서비스 상세화 방안
프로세스

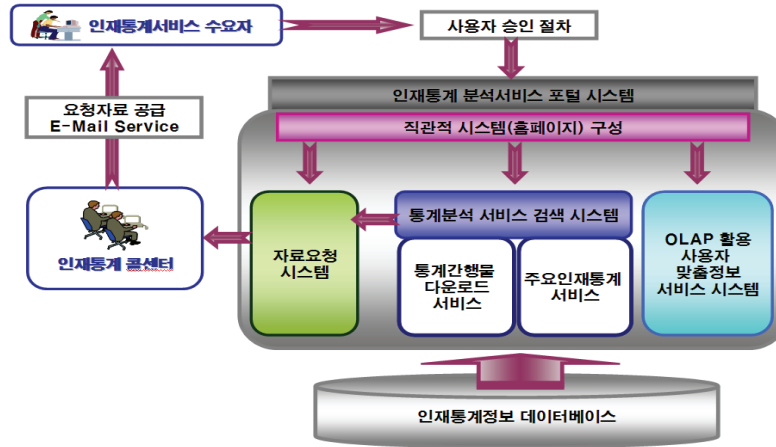
, CD-ROM,

7 : FRSS(Fast Response Survey System)



8 :





[그림 18] One-stop 통계 분석서비스 시스템 개념도

one-stop

. One-Stop

. One-Stop

(, OLAP (On-Line analytical processing))

,

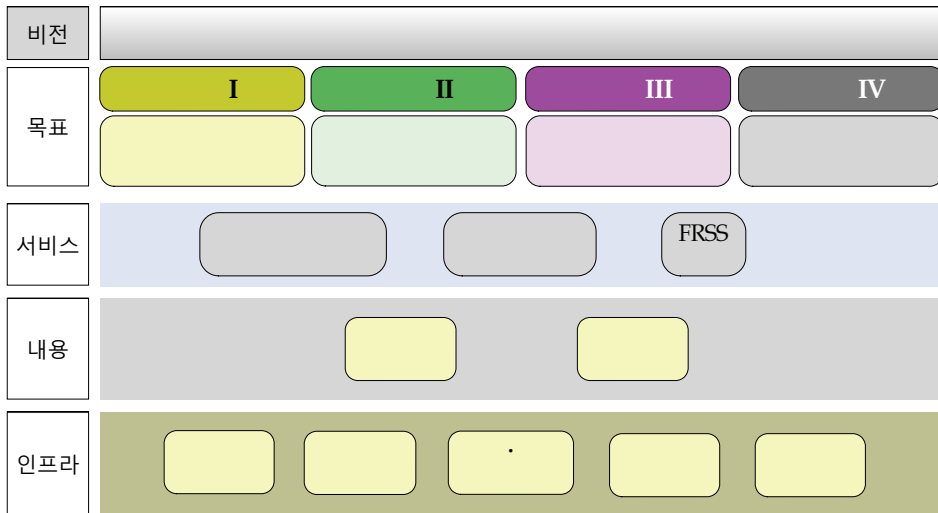
RSS(Really Simple Syndication)

4)

〈표 18〉 인재통계 품질 고도화를 위한 전략목표

9.	(Quality Standard)
	ISO
10.	

ISO 9000 . ISO 9000(International Organization for Standardization 9000)
ISO 1987 QM/QA , 3



〔그림 19〕 인재통계 혁신전략 체제



OECD . . . 2000

PISA , OECD .

OECD PISA .

OECD 21

OECD

OECD (EAG, Education at a Glance) .

. EAG (PISA),

(AHELO), (PIAAC) .

EAG PISA, AHELO, PIAAC

OECD

EAG, PISA

OECD

OECD

OECD

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창의적 인재통계의 발전과제

김 영 철
(한국교육정책연구원)

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Wallas(1926) ①

(preparation), ② (incubation), ③ (illumination), ④ (revision)

, Craft(2000) ① (preparation), ② (letting go), ③

(germination), ④ (assimilation), ⑤ (completion)

Taylor(1959)

① (expressive creativity), ②

(productive creativity), ③ (inventive creativity), ④

(innovative creativity), ⑤ (emergenative creativity)

Torrance(1995)

Osborn(1953, 1963)

Guilford(1959)

Eysenck(1972)

(1985)

(productive thinking)

Taylor(1988)

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Klenz(1987)

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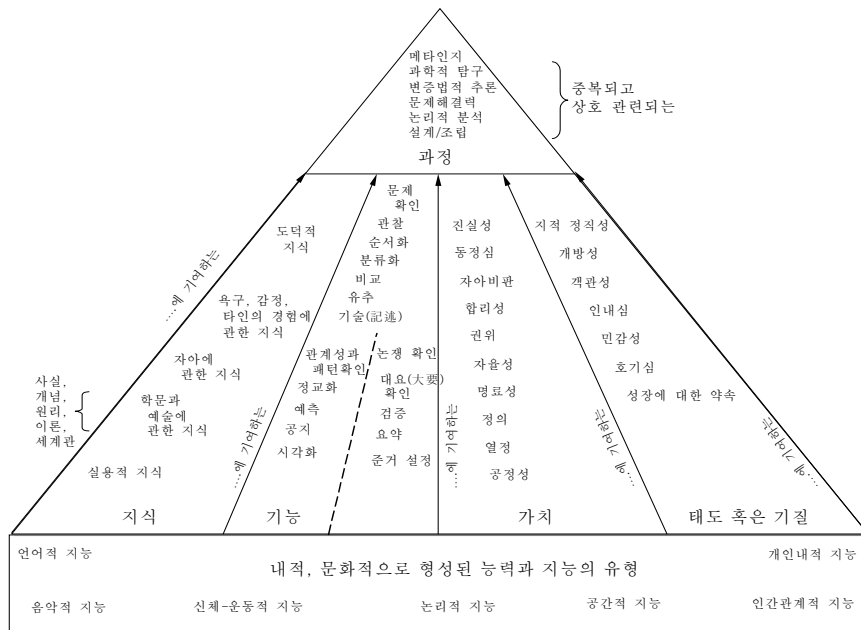
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: Klenz, S.(1987). *Creative and Critical Thinking*. Prince Albert, Sask.: Saskatchewan Education.

〔그림 1〕 창의성의 핵심 요소

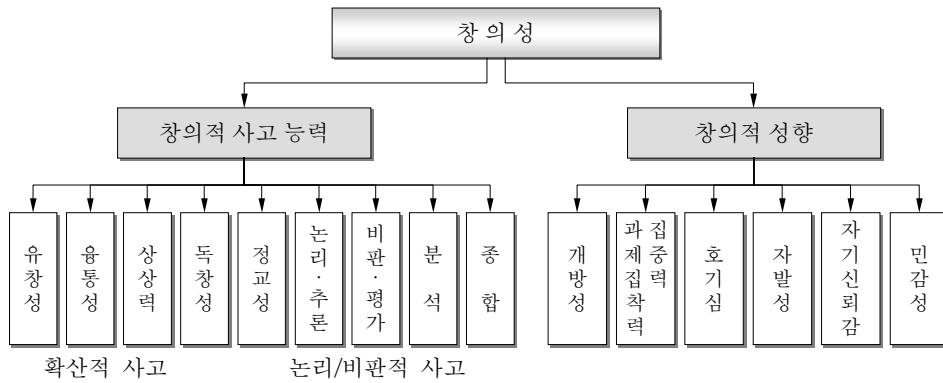
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Creative Thinker

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〔그림 2〕 창의성의 구성 요소

〈표 1〉 창의적 사고와 창의적 성향

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			(category)

: (2005). Creative Thinker . :

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Jackson, Shaw, Wisdom(2006) ,

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II. 창의적 인재 육성(교육)의 실상

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Ⅲ. 창의적 인재 육성 과제

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(Problem-based learning: PBL),

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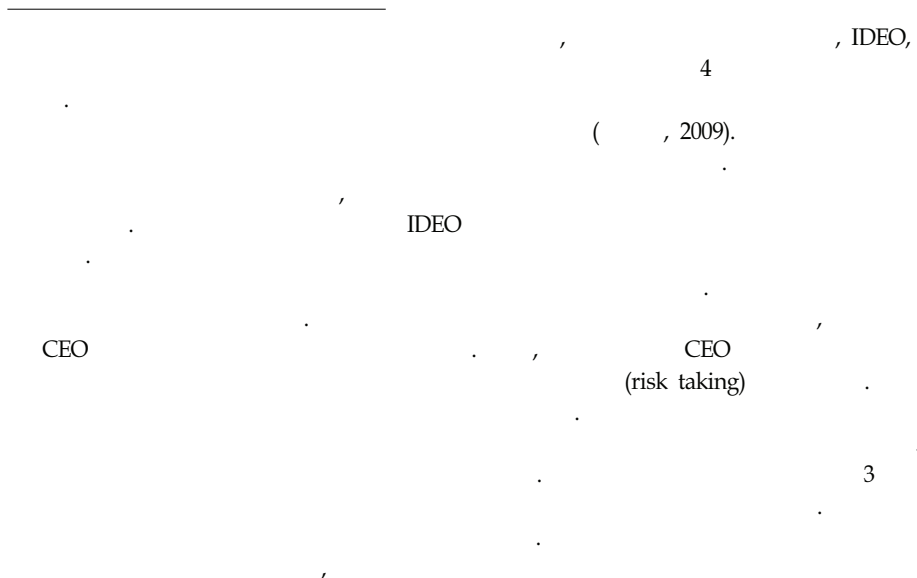
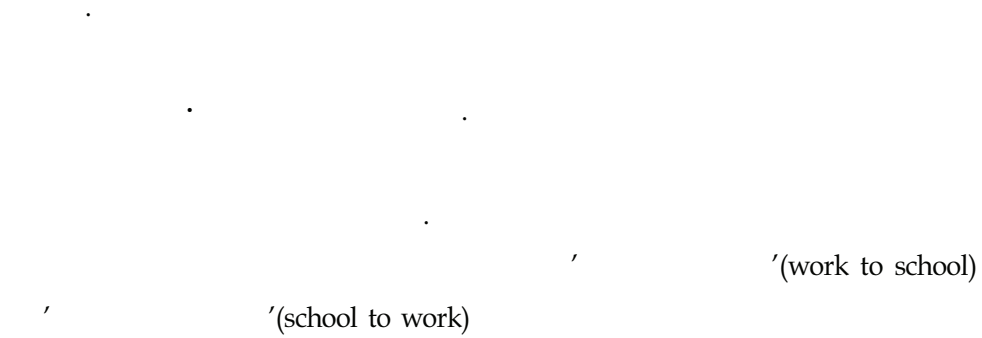
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I. 창의적 인재 통계 현황

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II. 창의적 인재 통계의 발전과제

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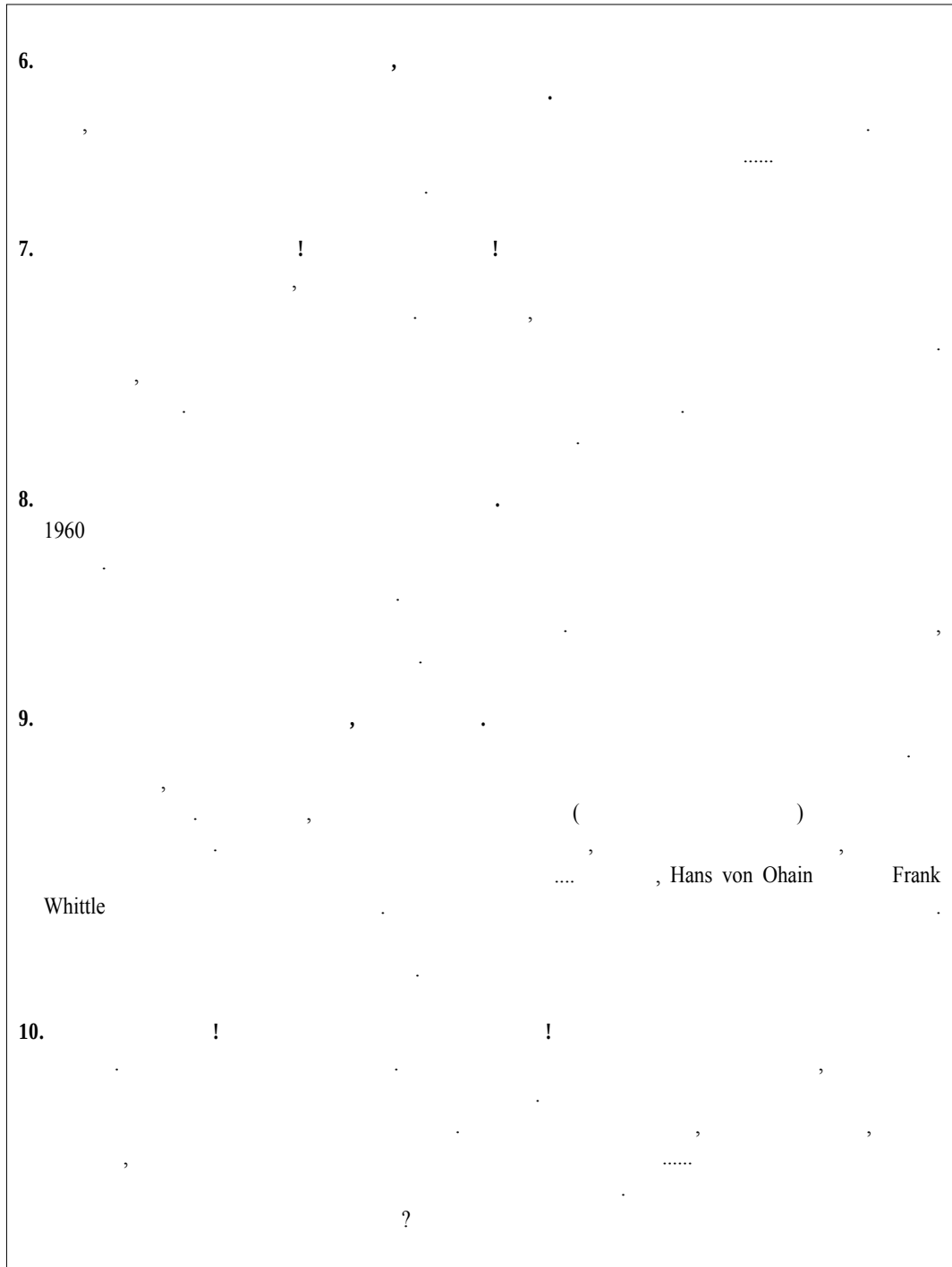
(1991). (V). .

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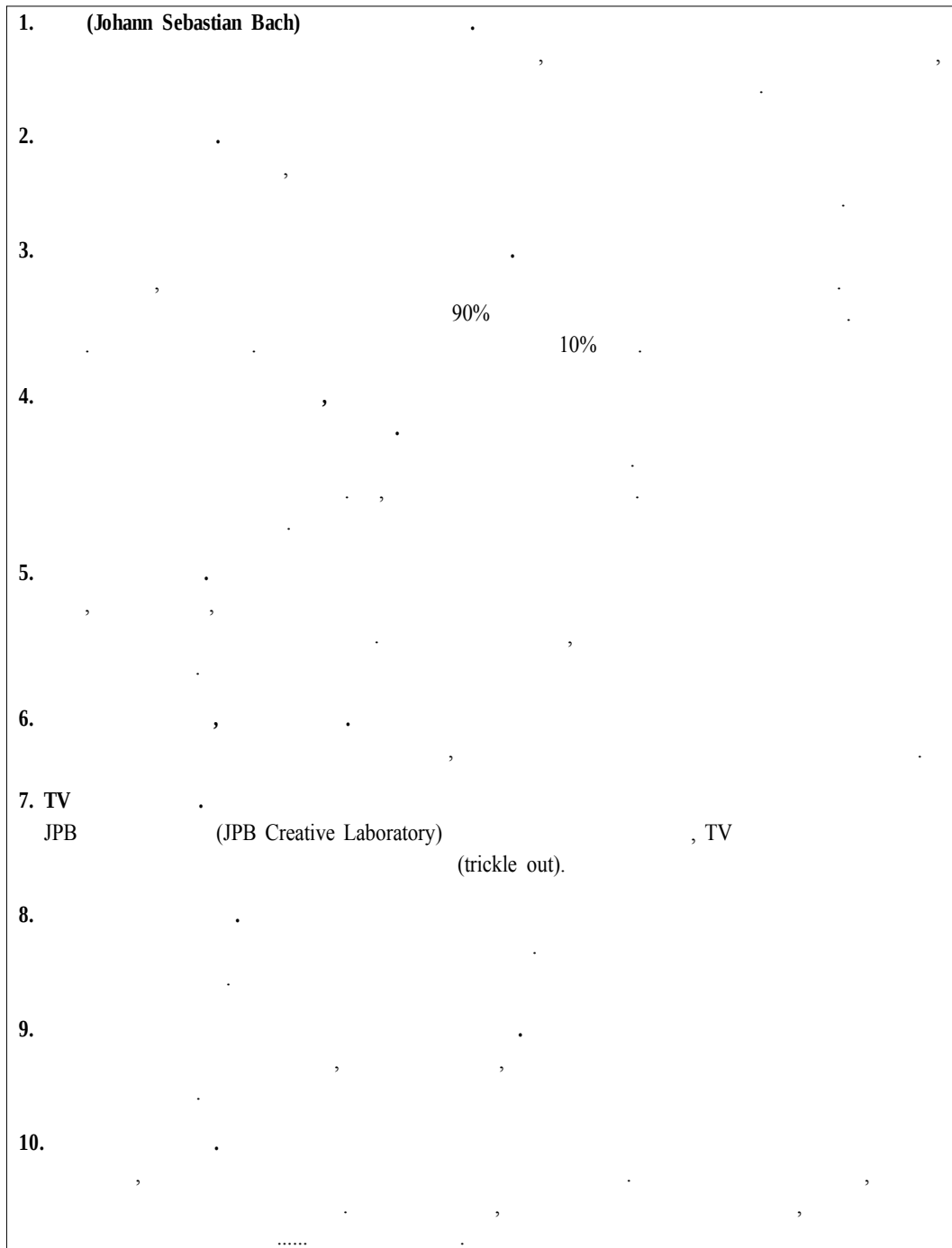
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http://www.jpbc.com/creative/article_creative_myths.php.



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<http://www.jpb.com/creative/creative.php>.

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SCAMPER

(Brainstorming)

, 1939 Osborn

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SCAMPER 7

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① S(Substitute):

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- ② C(Combine): ?
- ③ A(Adapt): ?
- ④ M(Modify-magnify-minify): , , ?
- ⑤ P(Put to other use): ?
- ⑥ E(Eliminate): ?
- ⑦ R(Rearrange-reverse): ?

2.

ALU

(Highlighting)

hit hit
hit (hotspot: ,) hotspot

. ALU

ALU Advantage(), Limitation(), Unique qualities()

3. (Creative Problem Solving)

(CPS)

Isaksen & Treffinger(1985) (, 1999).

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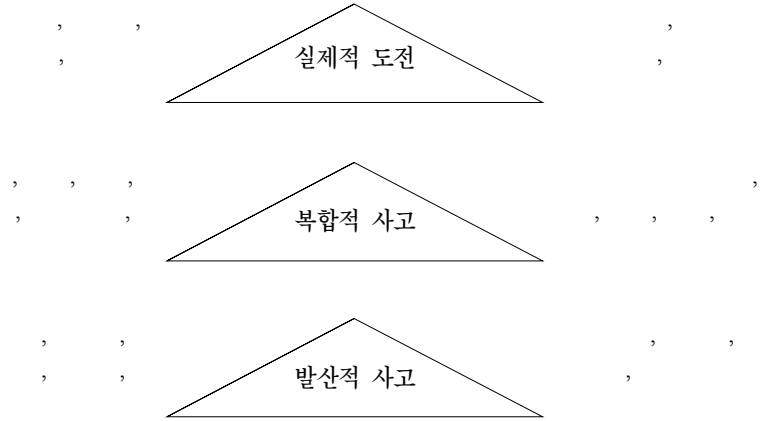
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Treffinger, 1998) ([−1]).

[부록 그림-1] 창의적인 학습 모형

인지적인 면

정의적인 면



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SCAMPER

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글로벌 인재육성을 위한 통계의 현황과 과제

정 기 오
(한국교원대학교)



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[193] 2008 03 19

(話頭)

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-人材

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„ (Credit Suisse
 2005.1.28)
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? FA(Free Agent)

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(Different), (Unique)
(Path)

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(gotldk : blog.chosun.com/gotldk 2004.8.20)

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Mink, Owen, & Mink(1993) -

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1. 글로벌 인재 개념의 정책적 배경

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(2008)

〈표 1〉 수월성 개념에 대한 대표적인 정의들

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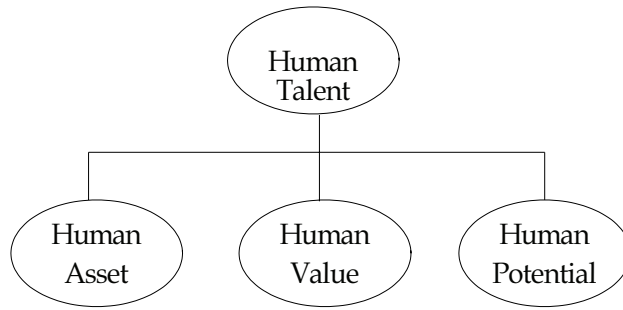
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(workin paper)

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: KEDI , 2008.4.

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□ (Human Talent)

○ Human Talent

○ , . . . ,

○ Talent: Excellent

○ Human Talent(Best People)

- Human Asset(Excellent People) :

- Human Value(Right People) :

- Human Potential(Future People) :

○ Talent

- : , / : / Martin Luther :

○ Mickles, E. (2001) 'The War of Talent'

- Mickles, E. 'The War of Talent' .

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○ Harvard Business Review

Talent

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- Cohen, J. M., Khurana, Reeves, L.(2005). Growing talent as if your business depended on it. Harvard Business Review, 83(10), pp.62-70.
- Cappelli, P.(2008). Talent management for the twenty-first century. Harvard Business Review, 86(3), pp.74-81.
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- Ready, D. A. & Conger, J. A.(2007). Make your company a talent factory. Harvard Business Review, 85(6), pp.68-77.

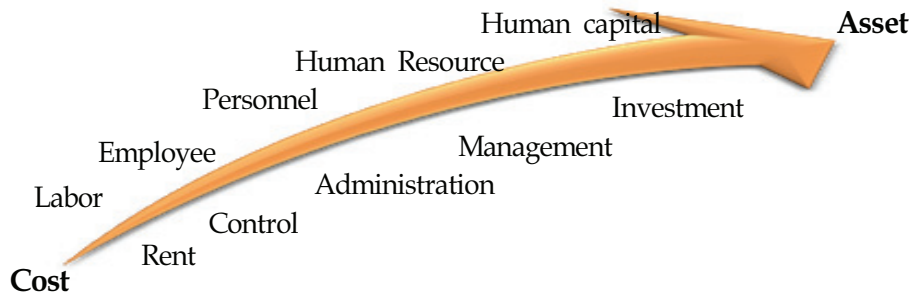
- Tom Peters(2007) Excellence
- Talent Excellence : Talent
- Talent Excellence Creativity Enthusiasm

☐ **Human Asset : Excellent People**

- Human Capital , , ,
- , , ,
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○ (OPM) (1999)

- . → , ,
- Human capital



- Harbison & Myers(1964)
 - "Education, manpower and economic growth: strategies of HRD"
 - In economic term, the purpose of national approach, accumulation of human capital and development of economy
- Wang & Swanson(2008)
 - "The idea of national HRD: An analysis based on economics and theory development methodology"
 - HRD Economics
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☐ Human Value : Right People

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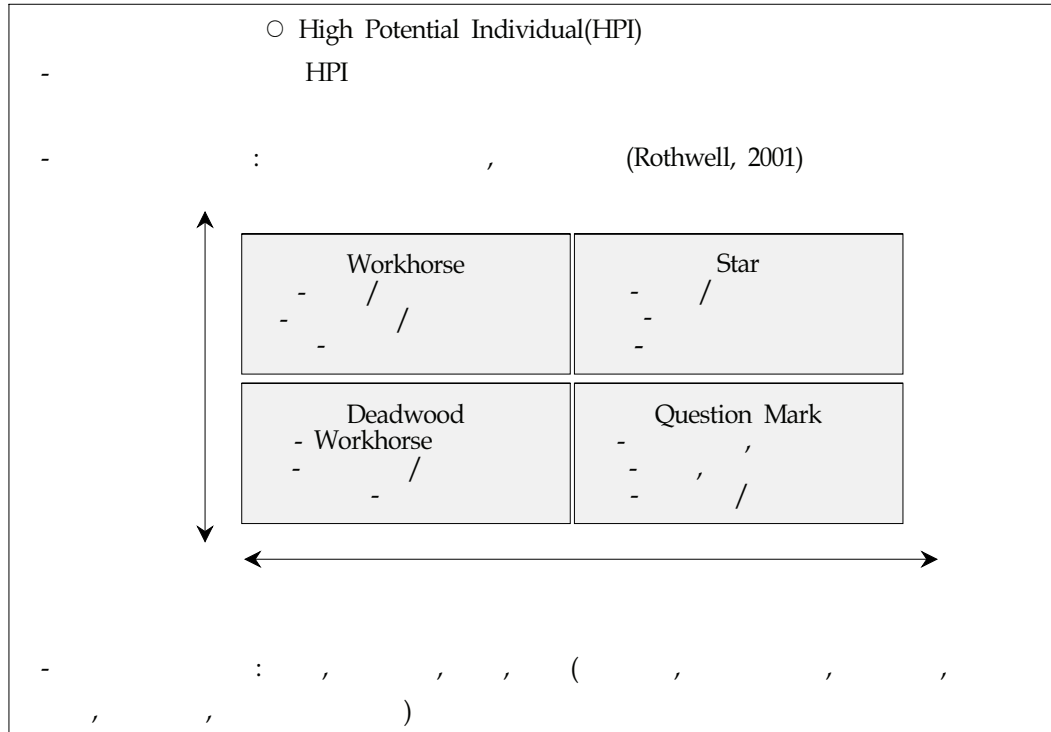
- Mickles, E(2001) "The War of Talent"
-
- Harbison & Myers(1964)
- "Education, manpower and economic growth: strategic of HRD"
- In social and cultural points, fuller and richer life, less bound by tradition
- in political terms, participation in political process, citizen in a democracy

☐ Human Potential : Future People

- Leader

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○ Human Competency Human Creativity

- (competency)

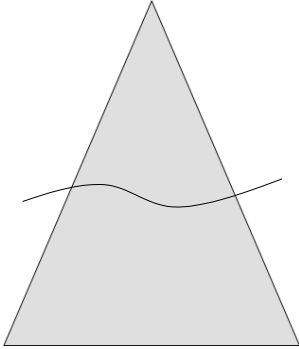
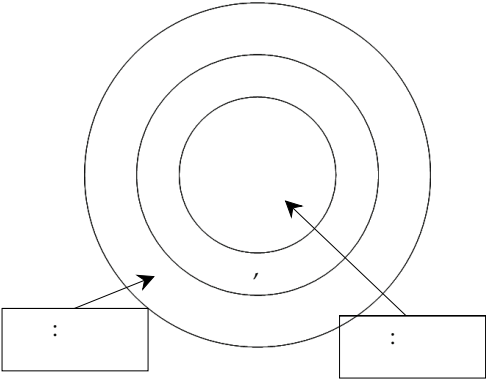
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- , , ,

- (creativity), (professionality),

○ Competency

- : , , , , , , , , (Spencer & Spencer, 1993)

○ Tom Peters(2007) Excellence

- : agricultural age(farmers), industrial age(factory workers), information age(knowledge workers), conceptual age(creators & empathizers)
- Human creativity is the ultimate economic resource.

KEDI
 (human resource)
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 ASTD(American Society for Training &
 D Development)
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 HRD
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 (“道”),

(education nationale) (nation building)

(education nationale)

(nation building)

(social capital)

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(manpower policy) (manpower planning)

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< -property>

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(development economic) - -

(盲目)

2. 정책과 데이터, 정책통계자료의 형태, 글로벌 인재통계

< -statistics>

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(state) < >

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17) Wang, G. J. & Swanson, R. A. (2008) "The idea of national human resource development: An analysis based on economics and theory development methodology. Human Resource Development Review. 7(1) p.79-106."

NHRD

NHRD

(strategic) .

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Talant(Asset, Value, Potential)

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< -authenticity>

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○ : _____

- talent-asset-value-potential

- (talent) (asset) (value) (potential)

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(operational definition)

(ex.) (operational definition)

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non-operational

○ < + + > : Authenticity

- Talent, value, potential

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1. Emotivism과 이해관계의 주체

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18) Mark Boyle and Suzanne Motherwell(2007). ATTRACTING AND RETAINING TALENT: LESSONS FOR SCOTTISH POLICY MAKERS FROM THE EXPERIENCES OF SCOTTISH EXPATRIATES in DUBLIN. www.scotecon.net

2. 행동주의와 조작적 정의 문제

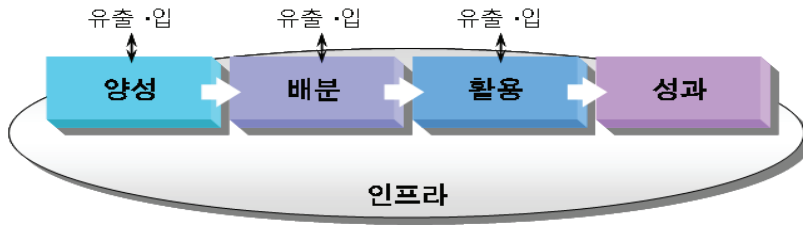
Human Value, Human Potential

3. 조사의 수준과 조사단위의 문제

4. flow와 stock

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”(: 2008b, 23)



[그림 1] 인재통계의 내용 체제¹⁹⁾

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① (全數調査) - , stock

flow ②

③ () ④

19) (2009) “

” KEDI



1. 경영학의 글로벌 인재 개념과 글로벌 기업의 관심

글로벌 인재 개념은 경영학의 관점에서, 기업이 해외에서 인재를 확보하고 활용하는 것을 의미한다. 이는 기업의 경쟁력을 높이기 위한 전략적 움직임이다. 글로벌 기업은 인재의 다양성을 중시하며, 다양한 문화와 배경을 가진 인재를 채용하고 육성한다. 이는 기업의 혁신과 성장을 촉진하는 데 기여한다.

HR (Human Resource) 관점에서, 글로벌 인재는 기업이 해외에서 인재를 확보하고 활용하는 것을 의미한다. 이는 기업의 경쟁력을 높이기 위한 전략적 움직임이다. 글로벌 기업은 인재의 다양성을 중시하며, 다양한 문화와 배경을 가진 인재를 채용하고 육성한다. 이는 기업의 혁신과 성장을 촉진하는 데 기여한다.

20) PSI (Personnel System Information) Global Talent Management Co.

“candidate”

5

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(人物),

Merrill Lynch

Sony 'Digital Dream Kid'
'Sony'
5
GE

4E(Energy, Energize, Edge, Execution)

(Value Chain)

HR

(Career)

Case

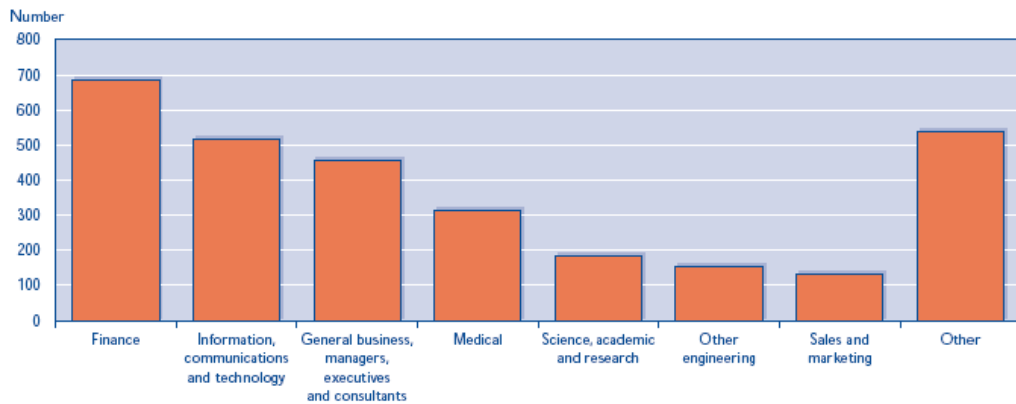
2. 국제기구와 정부의 움직임

ILSS(International Life

Skill Survey)

HSMP(Highly Skilled Migrant Programme)

〈HSMP 발급자 직업별 분류〉 21)



2003

21

1990

1970

30

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30

2000

21)

(2006)

p.24

“ ” 22)

2004 < (“ ”>

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21

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22)

2002

CEO
2008

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이공계특별법 정책사업 근거조문의 내용

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9	18 .
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11 .	20
12 .	21)
	22
	23
	24

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1. . (全週期的)

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2006-2010

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2 , 6 , 14 , 15 , 22

OECD “

(HRST)” (Canberra Manual), UNESCO(1984) “ ” ,
OECD “ (R&D) ” (Frascati Manual)

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OECD (Canberra Manual-1995) (ISCED
) (ISCO) (Human Resources
in Science and Technology)

a)

b)

a)

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OECD

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' R&D ' '

(R&D)"

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R&D 2002 252 4 3 750

R&D

100 , 19

8~9

R&D 1

10 5.6 (19.2) (10.8) (10.1)

15,000

2009 9 344,774 40

220,610 150 1

80%

200 300

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1300

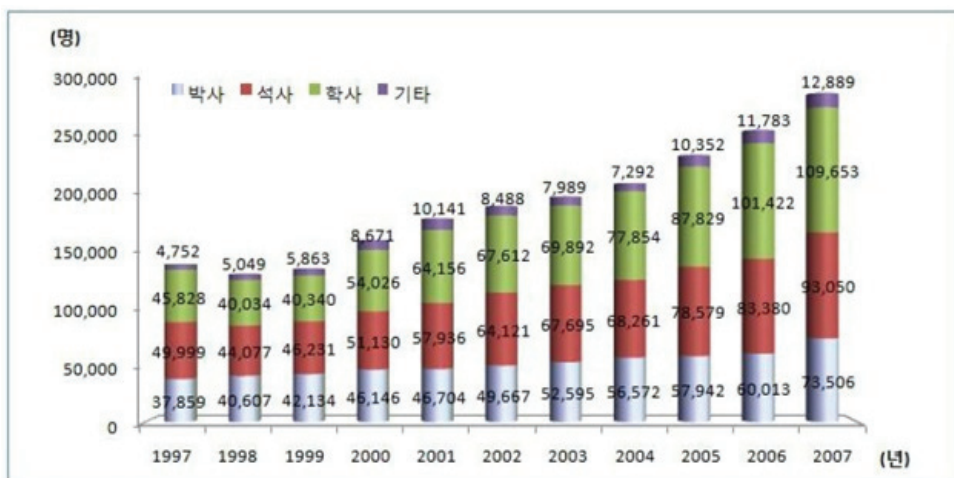
2020

1500

17

2007

-kistep



2009 7 10 2
 2002 2007 5 74%
 2950 5160 1300
 40 3700 2/3

	- : 2002 2959 2007 5160 . 74% - , 41% , 44% R&D 68% - . 25% . (2003 11.4%) , 4/5 . 77.5% 69.2% '2020
	-2007 40 3700 , 2/3 - 37.9 , 35 37.9% . 35 62.1% - 2800 ,
	-2005 1437 . 33% -2005 ~2007 , 4 49.2% 45.3% 51.2% 47.4% . 50% - 40.4% , 35 43.1% . 35 (38.6%)
	-48.7% . 10% , 83% . , 30.3% 27% - : (51.8%), (41.4%), (33.5%)
	- 47.3 > 40 2003 2 - 56.7 , 2003 8 ()

	- 55.2 , 80 8.1%(26.4%, 21.7%) -56%
	-54.5% , 1 2.91 SCI / EI 1 0.62 . - 3 88.4% 72.3% - SCI / EI 74.2% 46.8%

. : ILSS

23) ILSS

OECD

Robert Sternberg

. 15

OECD PISA

Global Skill

. ILSS

6

OECD

3. 근본적 혼란-국제비교교육통계와 글로벌인재통계의 혼동

OECD (Education At a Glance: EAG)
OECD EAG

23) 1998

practical cognition

National Education System

. OECD EAG, PISA

Global Talent ,

National .

1. 글로벌 시대의 정부역할과 통계 기능

글로벌 시대의 정부역할과 통계 기능

(industrial economy) <

> 21

stock data ①

flow

②③④

2. 인적자원 인적자산 인적자본의 구분

(人材) “材”

2 1

: “ ”

“ ”

< (人材)>

,
 ,
 < >(human resources)
 .
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 ,24)
 , < > (title)
 ,
 < >(human assets)
 .
 < >(human capital)
 (substance) (“ ”)
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 , (動態的)
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 “ (人材)”
 (物的材) “ (人的材)”
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24) Mankiw “ (, 4)

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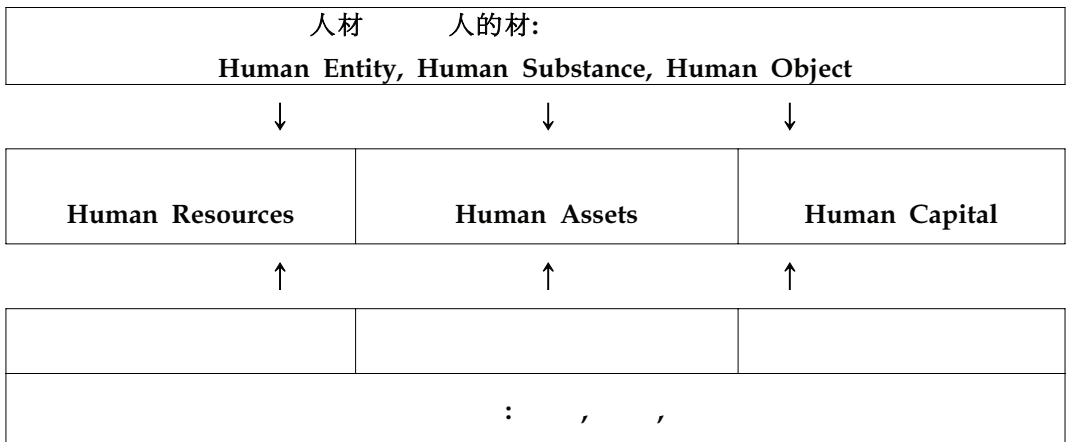
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☐ Human Entity

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- - - :
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☐

- , , → (“ ”)
- : , , () < >
- ex. ,
- , , ()
- resource assets (ex.)

☐

- 1: , (property, asset)
- 2: ,
- ex. , , etc
- :
-
- :
- :

☐

- :
- - _____ ,
- ,
- :
- Marx , - ,
- ① vs. → vs.
- ② : / → (, ,), →

- < > - authenticity
- → ()
- → (→)
- () → (programmed activities)
- - - post-modern

3

3. 글로벌 인적자원 통계: 사람에 체화되는 인적자원

(embodied)

< >

< >

15

4. 글로벌 인적자산 통계

use) < >(assets) . ,
(轉化) < (human assets)>
.25) ,
25) < >(human assets)

26)

(common's tragedy)

(轉化)

26)

(國有)

< >

< >

(一身專屬的)

(轉化)

(substantial human assets)

(relational human assets)

(trade mark)

4

() \			
	) , ,	) 1()	) 1()
	)	) 2() /	) 2() /

	Human Properties	-			
			(HRD)	(HRM)	(HRU)
	- -		-		
	(ex.)			()	
					,
				/	
				/	
				/	-
			,	/	
			,	/	
				/	
	trademarks			/	
				/	
	(service trademark)				

A sample of recently published patents statistics²⁷⁾

Australia (1996)

- Foreign patent applications, date of application, by inventor.
- USPTO grants, date of grant, by inventor.

European Commission (1997)

- EPO applications, date of priority, by inventor, including non-extended Euro-PCT since 1989.
- EPO applications, date of publication, by inventor, including non-extended Euro-PCT.
- USPTO grants, date of priority, estimates since 1992.
- USPTO grants, date of grant.
- Triad applications (patents which, in addition to the country of origin, are filed in at least two foreign markets in two different triad regions).

Germany, BMBF (1998)

- Triad applications (patents which, in addition to the country of origin, are filed in at least two foreign markets in different triad regions), figure I/15.

France, OST (1998)

- EPO applications, date of application, by inventor, including non-extended Euro-PCT for the last few years.
- USPTO grants, date of grant, by inventor.

Japan, STA (1996)

- JPO applications, and grant.
- Domestic (resident) patent applications (including PCT), and domestic grants.

27) OECD USING PATENT COUNTS FOR CROSS-COUNTRY: COMPARISONS OF TECHNOLOGY OUTPUT, p.133

- Foreign applications (including PCT) and grants.

The Netherlands (1994)

- EPO grants, date of priority.

OECD, MSTI (2000)

- Applications from OECD Member countries, resident and non-resident applications, by date of application/ or publication, by country of residence of the applicant.

STI Review No. 27

134

© OECD 2001

patent-based indicators in response to the steady increase in demand for indicators for economic analysis, coupled with a distinct improvement in data supply (databases are a richer source of information and more widely available), underlines a crucial need for harmonisation.

This article addresses basic methodological problems associated with patent counts. Its aim is to propose rules and methods for calculating higher-quality patent-based indicators of the technology produced and used by countries. A range of issues relating to the counting process are addressed: choice of patent office, choice of a reference date, choice of country of attribution, and choice of the set of patents to be counted (domestic patents and patent "families").

II. PATENTS AS A SOURCE OF STATISTICAL DATA

The information content of patent documents

A patent applicant files a document with the patent office of the country in which he is seeking protection for his invention. The patent document is a rich

Box 2. A sample of recently published patents statistics (cont.)

United States, NSF (1998)

- USPTO grants, date of grant, by inventor.
- Grants in large countries, date of grant, by inventor.
- Patent families for certain technology areas, by priority date, by priority country.

Sources: BMBF (1998), Bundesministerium für Bildung und Forschung, *Facts and Figures 1998*.

Department of Industry, Science and Technology (1996), *Australian Business Innovation*

-- *A Strategic Analysis*.

European Commission (1998), *Second European Report on S&T Indicators, 1997* --

Appendix.

Japanese Science and Technology Agency (1996), *Indicators of Science and Technology*.

Het Nederlands Observatorium van Wetenschap en Technologie (1994), *Wetenschap*

-- *en technologie* -- *Indicatoren, 1994*.

NSF (1998), *Science and Engineering Indicators, 1998*.

OECD (2000), *Main Science and Technology Indicators, 2000-2*, Paris.

OST (1998), *Science et Technologie* -- *Indicateurs 1998*, Paris

5. 글로벌 인적자본 통계

「 」
 (capital) “
 (the equipment and structures
 used to produce goods and services)”
 (公理) .28)
 < (resources)>

< (capital)> (etymology) 4 (意
 味素) : ① (source), ②
 (talent), ③ , ④
 - (life).

 (cattle)
 (live-stock)

28) Jonathan Nitzan(1998).
 “Differential accumulation: towards a new political economy of capital.” Review of International
 Political Economy 5:2 Summer 1998: 169-216

< -capital> .29)

“ ”) . (< > . < ()= + >

, 20

29) . “The circulation of commodities is the starting point of capital. The production of commodities, their circulation, and that more developed form of their circulation called commerce, these form the historical groundwork from which it rises. The modern history of capital dates from the creation in the 16th century of a world embracing commerce and a world-embracing market. If we abstract from the material substance of the circulation of commodities, we find its final result to be money: this final product of the circulation of commodities is the first form in which capital appears.”

- (labor power) (labour) 1
(capacity) (capabilities) 30)
< >
31) <
>
32)
(capacity)
(labour itself)
< (labour power in-use labour power in-action)³³⁾
(" "). < >
< > 34)
,
-
- 30) "By labour-power or capacity for labour is to be understood the aggregate of these mental and physical capabilities existing in a human being, which he exercises whenever he produces a use-value of any description."
31) " " , 3
32) The value of labour-power is determined, as in the case of every other commodity, by the labour-time necessary for the production, and consequently also the reproduction, of this special article.the value of labour-power is the value of the means of subsistence necessary for the maintenance of the labourer. Labour-power, however, becomes a reality only by its exercise; it sets itself in action only by working. But thereby a definite quantity of human muscle, nerve, brain, &c., is wasted, and these require to be restored. When we speak of capacity for labour we do not abstract from the necessary means of subsistence
33) THE capitalist buys labour-power in order to use it; and labour-power in use is labour itself..... The purchaser of labour-power consumes it by setting the seller of it to work. By working, the latter becomes actually, what before he only was potentially, labour-power in action, a labourer.
34) While the labourer is at work, his labour constantly undergoes a transformation: from being motion, it becomes an object without motion; from being the labourer working, it becomes the thing produced. At the end of one hour's spinning, that act is represented by a definite quantity of yarn; in other words, a definite quantity of labour, namely that of one hour, has become embodied in the cotton.

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19

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(flow)

(stock)

stock

flow

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infra

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<human

resource in action>

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HRD

6. 향후 과제

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(人材)

(人材

統計)

(大學之道: 物有 本

末 事有 終始)

(2008).
R2008-26-01.
(2008) :
(2006),
(1999),
(2006)
(2008)
(2008),
(2006),
(2006). 2006 4-15.
(2003),
(2005),
(2002),
(2006),
(),

Auriol, Laudeline (2007), Labour Market Characteristics and International Mobility of Doctorate Holders: Results for Seven Countries. OECD. STI WORKING PAPER 2007/2

COMMISSION OF THE EUROPEAN COMMUNITIES(2000).Making a reality of The European Research Area: Guidelines for EU research activities(2002-2006)

- Boyle, Mark, Suzanne Motherwell(2007). ATTRACTING AND RETAINING TALENT: LESSONS FOR SCOTTISH POLICY MAKERS FROM THE EXPERIENCES OF SCOTTISH EXPATRIATES in DUBLIN. www.scotecon.net
- Patrica Kubow et al., Multidimensional Citizenship: Educational Policy for the 21st Century, In John J. Cogan, Ray Derricott(eds.), Citizenship for the 21st Century-An International Perspective on Education(London: Kogan Page Limited, 1998)
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- Pissarides, Christopher A.(2000) HUMAN CAPITAL AND GROWTH: A SYNTHESIS REPORT OECD Deveopment Center Working Paper No. 168.
- OECD Handbook for Internationally Comparative Education Statistics: Concepts, Standards, Definitions and Classifications
- OECD USING PATENT COUNTS FOR CROSS-COUNTRY: COMPARISONS OF TECHNOLOGY OUTPUT
- OECD(2009) Measuring Capital: OECD Manual, SECOND EDITION.
- Staitistics Canada and NCES, US(1998) International life Skills Survey Project Advisory Group Briefing Materials.

과학기술인재육성을 위한 통계의 현황과 과제

이 정 재
(KISTEP)

1. 개요

(OECD, , ,)

2. 용어 정립 : 인력(통계) vs 인재(통계)

35)

BK21

, MB

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35)

(人才)

(人材)

(2008) “ ‘ ’ ” ,
“ ’ ” . 21

164 국가 인재통계 혁신 전략과 과제

(2006) (2001)
NSF

(2008)

4. 과학기술인력정책 관련 주요 방향

MB
「
(2006~2010)」
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〈표 1〉 이공계인력 육성·지원 기본계획(2006~2010) 수정의 주요 방향

기존		추진전략의 변화	수정	
추진 영역	중점 추진 과제		중점 추진 과제	추진 영역
	1.	○ () ○ -	1.	
	2. .		2.	
	3.		3.	
	4.	○ () ○ .	4.	
			5.	
			6.	
	5.	○	7.	
	6. ()		8. .	
			9.	
	7. . .	○ (sector council) ○ / ○	10. . .	
	8.		11.	
	9. .		12.	
	10.		13.	

11.	○	14.	15.
12.			
13.			
14.			

: . (2006~2010)

5. 과학기술인력의 범위와 규모

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 OECD, UNESCO
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 (2).
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 () OECD
 (1
).

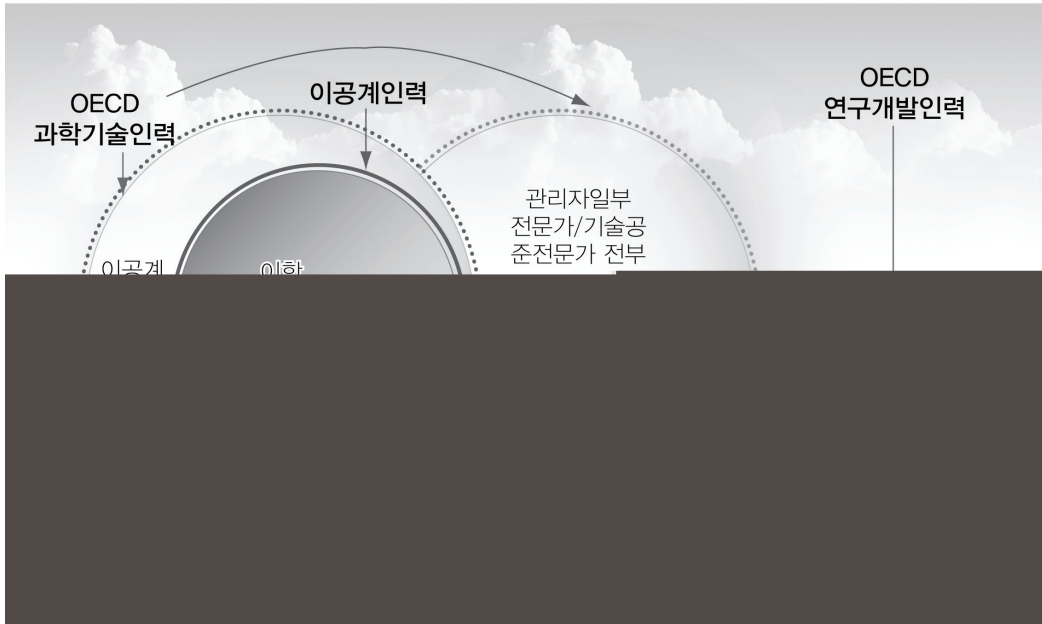
〈표 2〉 이공계(과학기술)인력의 국제기준 비교

		OECD	UNESCO
		HRST	STP
	/ /	/ / / /	/ / / /
		/	/
	.	.	.
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: (2007)

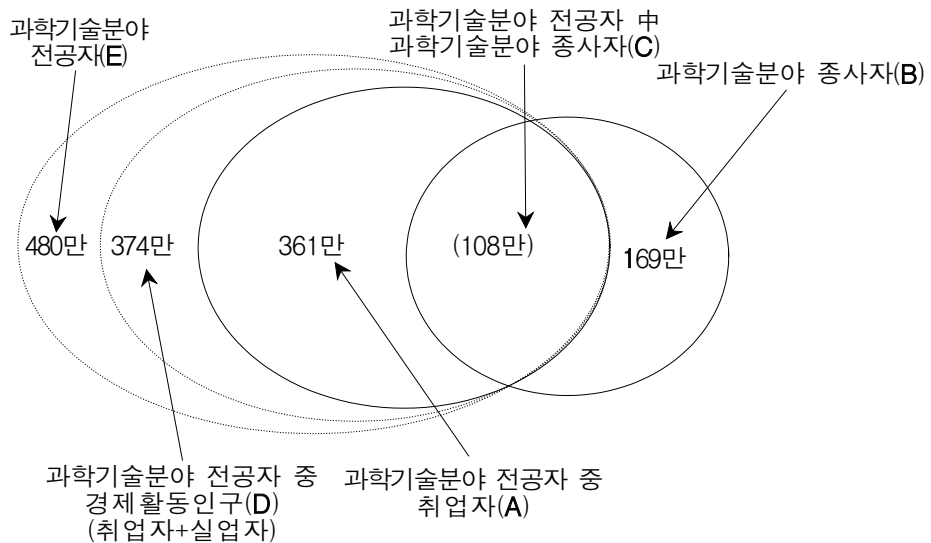
.

(2007) , 2005 499
 , OECD 1,110
 OECD
 , 540 (2).



: (2007)

〈그림 1〉 이공계인력과 OECD 과학기술인력 범위



〈그림 2〉 국내 과학기술인력의 규모

6. 국외 과학기술인력관련 통계 현황³⁷⁾

. OECD

OECD

MSTI(Main Science and Technology Indicators) , , STI Scoreboard(Science, Technology and Industry Scoreboard) .
() ,
(Careers of Doctorate Holders)'

1) MSTI (Main Science and Technology Indicators)

MSTI OECD (EAS, Economic Analysis and Statistics)
2 (,)
OECD 30 (,
,) 9
, ,
, , 1981
,
(Headcount) FTE(, , Full Time Equivalent)
38) , , (,
,)

2) STI Scoreboard (Science, Technology and Industry Scoreboard)

STI Scoreboard OECD ,

³⁷⁾

³⁸⁾ :

OECD
 ((EAS, Economic Analysis and Statistics) (NESTI,
 National Experts on Science and Technology Indicators)
 , 2007
 9
 OECD

3) (CDH, Careers of Doctorate Holders)
 2004 OECD CSTP(Committee for Scientific and Technological Policy)

, 2005 CDH , CDH OECD NESTI
 . NESTI 2005 2 40
 CDH , ,
 (, , ,
) (), ,
 . 2005 7 (, , , , ,
) 39) 2007
 . CDH

39) OECD(2007), 'Labour market characteristics and international mobility of doctorate holders: Results for seven countries,' STI working paper 2007/2, OECD

(SED),

(NSCG),

(NSRCG),

(SDR)

(3).

SED SGSPCE

WebCASPAr (Integrated

S&E Resource Data System) DB

, NSCG, NSRCG, SDR

SESTAT(Scientists and Engineers Statistical Data System) DB

조사명	조사대상	조사내용	비고
(SED)	()	, ,	()
(SCSPSE)	, ,	, , ,	
(NSCG)		, , ,	()
(NSRCG)	,		
(SDR)				post-doc , ,

) 1. SED(Survey of Earned Doctorates), SGSPST(Survey of Graduate Students and Postdoctorates in S&E), NSCG(National Survey of College Graduates), NSRCG(National Survey of Recent College Graduates), SDR(Survey of Doctorate Recipients)

1) (SED)

SED 1958

1

2007 420 48
(Science and Engineering
Doctorate Awards)

2) (SGSPSE)

SGSPSE NSF NIH

(),
2007 582
375 207

(Graduate Students and Postdoctorates in S&E)

3) (NSCG)

NSCG

1993
1990 75
95 , 97 , 99 93
93
2 , 4~6 2003
2003 2
17

SESTAT

4) (NSRCG)

NSRCG 2

(Characteristics of Recent Science and Engineering Graduates)'

5) (SDR)

SDR

SED , 2006

42

(Characteristics of Doctoral Scientists and Engineers in United States)'

(4).

(Survey on Postdoctoral Fellows and Research Assistants)' .

(Survey on Career Paths of Postdoctoral Fellows)' 8

(, ,)

(,) 40).

(Survey on Research Activities and Attitudes of Postdoctoral Fellows)' (, , , , ,) 2.7

30 , 70%

41).

〈표 4〉 일본의 과학기술 관련 주요 통계조사 및 자료집

구분	명칭	주관기관	주요내용
			, , , http://www.stat.go.jp/data/kagaku/2009/index.htm
		NISTEP	(, ,) ,
		NISTEP	
			, , ,
			, , ,

40) NISTEP(2007), "Survey of Trends in Career Paths of Postdoctoral Fellows at 8 Insitutions", Research Material 148

41) NISTEP(2009), "Survey on Research Activities and Attitudes of Postdoctoral Fellows", Research Material 159

		NISTEP	,
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1)

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2009 136 , 11 , 36 183
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〈표 5〉 과학기술연구조사(2009) 조사 항목

- (1) 명칭, 소재지
- (2) 사업의 종류(기업 등, 비영리단체·공적기관)
- (3) 자본금, 총매상고, 영업이익(기업 등)
- (4) 지출총액(비영리단체·공적기관, 대학 등)
- (5) 종업원총수(기업 등, 비영리단체·공적기관)
- (6) 연구 실시유무(기업 등, 비영리단체·공적기관)
- (7) 대학 등의 종류(대학 등)
- (8) 연구의 종류(비영리단체·공적기관)
- (9) 연구 내용의 학문별 구분(비영리단체·공적기관, 대학 등)
- (10) 연구 관계 종사자수(연구자, 연구보조자, 기능자, 연구사무 등의 관계자) (기업 등, 비영리단체·공적기관)
- (11) 종업자수(연구자, 연구보조자, 기능자, 연구사무 등의 관계자, 연구이외의 업무에 종사하는 자) (대학 등)
- (12) 연구자(대학 등은 본 임무자) 가운데 박사학위 취득자수
- (13) 연구자(대학 등은 본 임무자)의 전공별 내역
- (14) 채용·전입, 전출 연구자수
- (15) 내부사용 연구비(인건비, 원재료비용, 유형고정자산의 구입비용, 리스료, 기타

경비)

- (16) 유형고정자산의 감가상각비(기업 등)
- (17) 성격별 연구비(기초연구, 응용연구, 개발연구)
- (18) 제품·서비스 분야별 연구비(자본금 1억엔 이상의 기업 등)
- (19) 특정 목적별연구비(자본금 1억엔 이상의 기업 등, 비영리단체·공적기관, 대학 등)
- (20) 수탁연구비
- (21) 위탁연구비
- (22) 국제기술교류 상대기업의 국적명 및 대가(수취, 지불)액수 (기업 등)

2) (Survey on Postdoctoral Fellows and Research Assistants)

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3) (Survey on Career Paths of Postdoctoral Fellows)

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7. 국내 과학기술인력관련 통계 현황

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〈표 6〉 국내 과학기술인력 관련 조사통계 현황

구분	공급		수요
		수급	
종합 통계	·교육통계조사(KEDI) ·고등교육기관 졸업자 취업 통계조사(KEDI) ·외국박사학위정보(학술진 흥재단)	·인구주택총조사(통계청) ·경제활동인구조사(통계 청) ·산업직업별 고용구조조 사 (한고원) ·국가 중장기 인력수급전 망 (교과부)*	·지역별고용조사(통계청) ·노동력수요동향조사(노동부) ·임금구조기본통계조사(노동부) ·한국노동패널조사(노동부) ·대졸자 직업이동 경로조사(한고 원) ·전문대 및 대학 졸업자 취업조 사(직능원) ·석·박사 졸업자 취업조사(직능원)
부문별 통계		·이공계인력 중장기 수급 전망(KISTEP)* ·IT전문인력 수급차분석 및 전 망(지경부)*	·이공계인력실태조사(KISTEP) ·연구개발활동조사 (KISTEP) ·여성과학기술인실태조사 (NIS WIST) ·정보통신부문 인력동향 실태조 사(정보통신산업협회) ·산업기술인력 수급동향실태조 사(산업기술재단) ·이공계인력 해외 유출입 현황 조사 ·국가연구개발사업 조사·분석

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〈표 7〉 국내 과학기술인력 주요 조사통계

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〈 표 9 〉 이공계인력 해외 유·출입 현황 조사의 주요 지표 (06년 기준)

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8. 국내 과학기술인력 관련 통계현황 분석 및 개선방향

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SDR, OECD CDH

〈표 10〉 과학기술인력 관련 통계 현황 분석 결과

OE CD	MSTI	○									○	○	○	
	STI Scoreboard	○	△								○	○	○	
	(CDH)		○		○								○	
	(SED)		○	△									○	
	(SGSPSE)	○		△				○	○					
	(NSCG)		○	△							○	○	○	
	(NSRCG)		○	△							○	○		
	(SDR)		○	△	○								○	
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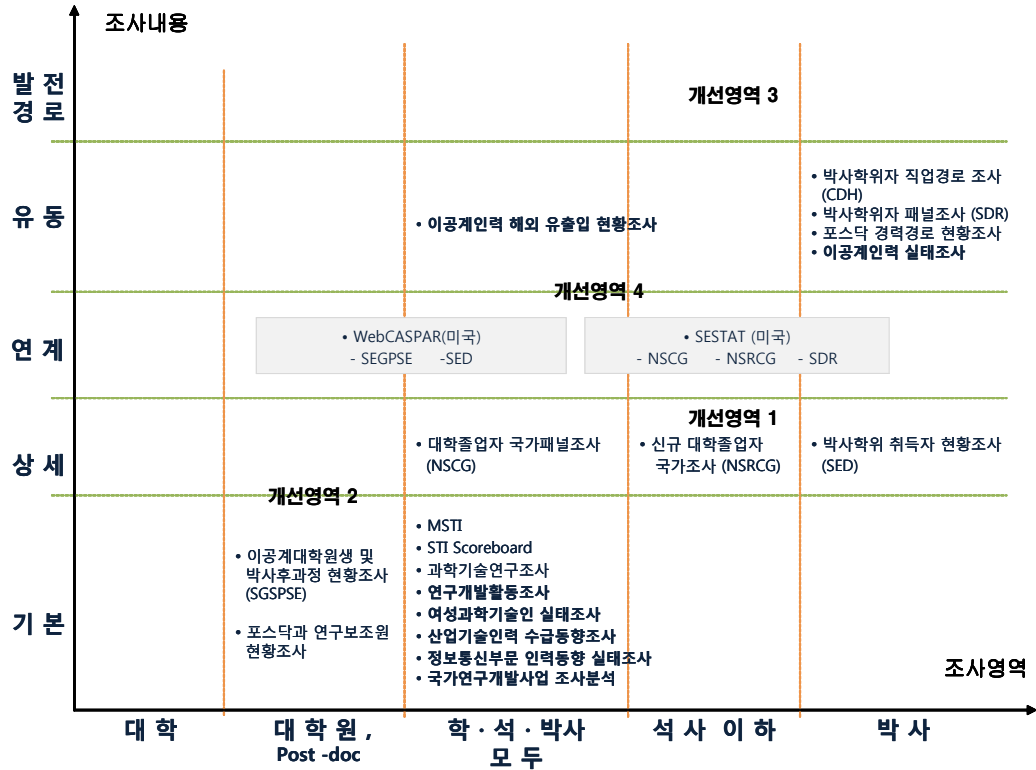
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〈그림 3〉 과학기술인력 관련 통계 현황과 개선영역 (포트폴리오)

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www.nsf.gov

www.oecd.org

www.nistep.go.jp

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2. STI Scoreboard ()

OECD

3. CDH

CDH(2005)

분류	항목
박사학위 교육과정	· 학위수여기관, 학위수여분야, 학위의 분야, 학위과정, 학위수여 연도, 학위기간, 박사학위이전 학위국가, 박사과정 재원
최근 졸업자	· 지난 1년간 학위취득박사 : 학위수여기관, 이전 교육기관, 학위취득부터 첫 취업까지 기간
고용 상황	· 고용상 지위, 취업시간, 연간 근로소득, 현재 취업처 특징 · 업무 특성(전문성 요구 정도, 전공과의 관련성) · 풀타임 구직 여부, 직업만족도 · 포스트닥 지위 여부, 포스트닥 이유, 포스트닥 재원 · 이전 취업처의 특성 · 실업 혹은 비경활자, 구직 활동여부, 구직활동 안 한 이유
국제 이동	· 지난 1년간 거주한 국가 · 자국에서 출국 이유, 입국한 국가로의 입국 이유, 현재 입국한 국가에서 체 류 계획, 본국과의 연계성 정도, 향후 체류하고자 하는 국가
진로 관련 경험과 과학 생산성	· 당해 교육 경험 여부 · 교육 활동의 업무 비중 · 연구원 경험 여부 · 비연구원: 비연구원의 비연구활동 이유, 향후 연구활동으로의 전환 계획, 이 전 연구원 경험 여부 · 연구원(현재와 과거) : 연구원 선택 이유, 연구원 활동 기간 · 공인학술지에 연구논문게재 건수 · 특허권 보유 여부, 특허의 상용화 여부 · 창업 여부, 멘토링 프로그램이나 훈련 프로그램 실시 여부 · 석박사 논문지도 여부 · 국제 연구자와의 연구교류 여부
인적사항	· 생년월일, 출생지, 국적, 혼인여부, 부양가족 수

4. SDR

SDR(2005)

영역	항 목
현재 고용 상황	<일반현황> · 취업 여부, 구직여부(미취업이유, 취업시기), 미취업자(미취업 이유, 취업 시기, 이전직업 유형), 주당 취업시간, 풀타임/파트타임/파트타임 이유, 취업 전 퇴직 여부
	<현 직장> · 고용주(주소, 이름, 사업유형, 회사규모, 회사 연혁) · 회사유형(자영업, 민간부문 영리, 민간부문 비영리, 지방정부, 주정부, 군, 연방정부-공무원, 기타) · 교육기관여부(유형, 지위, 교수지위, 종신교수지위)
	<현 직장의 주 업무> · 현 직장의 주 업무 · 직업유형(자유 응답식, 코드 기입), 직무수준(전공분야별 학사이상/이하), 포스트닥 여부 및 이유, 현재직업의 취업기간 · 전공분야와 직무관련성 : 직무관련성이 없는 분야에서 일하는 이유, 직무내용/주된 요소 · 타인 대상 감독 여부 : 직무만족도(임금, 기타 혜택, 안정성, 위치, 승진 기회, 지적 도전감, 책무성정도, 독립성 정도, 기여도, 전반적 만족도) · 근로소득/근로시간, 근로주간 · 작년기준 정부 지원 사업수행여부/정부 부처 유형 · 작년 소득
과거 고용 상황	· 취업여부(1년 전과 당해 달), 직장이동 여부 및 이유
기타 취업 관련 경험	· 일반 논문의 수, 인정학술지 게재, 책자 발간, 특허취득여부 · 학회소속 및 참여 활동 · 연수나 세미나 참여 여부, 이유 · 직업에서 가장 중요한 요소
최근 교육 경험	· 지난 2년간 학위취득여부, 학위취득분야, 학위취득년도, 학위취득 기간 학위 취득이유 · 학위취득경비의 고용주 지원여부 · 대학수강여부, 수강형태, 학위취득목적여부, 수강영역, 수강이유, 수강비에 대한 고용주 지원여부
인구 학적 요인	· 결혼여부, 배우자 취업여부, 배우자 취업유형, 자녀유무 및 수, 자녀동거여부, 국내거주여부, 미국국적보유여부, 외국국적과 비자유형, 최초 미국 체류시기, 첫 비자 유형, 미국체류이유, 다중국적여부, 생년월일
장애 인용 질문	· 장애유형, 최초장애경험시기, 주소 · 주소, 설문지에 대한 평가

연구자료 RRM 2009-32

국가 인재통계 혁신 전략과 과제

2009 12 4

한국교육개발원 원장 김 태 완

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: (02) 3460-0120

<http://www.kedi.re.kr>

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: (02) 2263-5931

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