



Ah! Nova!

(Ah! Elderly and a sea of information)

Seung-won Kim, Leena Kim, Jisu Choi

Contents

- Reason for topic
- Data and research methods
- Digital Informalization Level
- Analysis for the reasons
 - Correlation with digital informalization level
 - Regression analysis on age and digital informalization level
 - Digital informalization level among generations
 - Factors that affect elderly's digital informalization level
 - Sex
 - Income level
 - Education
 - Region
 - Level of satisfaction according to elderly's usage of internet
- Analysis on solutions
 - Elderly who voluntarily doesn't / does use internet
 - Elderly's reasons of using digital devices
 - Supply of digital class according to elderly's sex
- Suggestions of solutions
 - Summary of analysis
 - Distribution and problems of smart phone education organizations for elderly
 - Solutions
- Strength and weakness of research



Reason for topic



노인들은 우리와 다른 세상을 살고 있다 노인을 위한 디지털은 없다
노인의 디지털 소외, 생활에 불편 겪고 허위정보에도 취약
기술 및 허위정보 교육 이뤄지지만 일부만 수혜, 노인 내 수준차도 고려해 “나쁜 뉴스 알려주기 대신 뉴스 보는 기준 고민 끌어내야”

스마트폰 보유율, 70대와 타 연령대 격차 더 벌어져

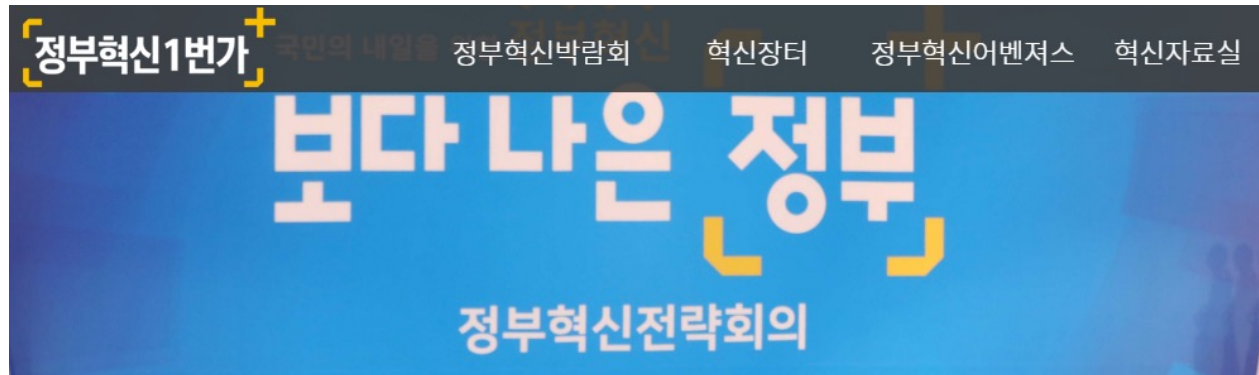
65세 이상 고령층 내에서도 격차...소득 낮은 노인가구 중점의 정책 필요

[블로터13th] 노인을 위한 IT는 없다
생존의 문제로 치닫고 있는 노인 정보격차 문제

[illegible]

Data

- " 보다 나은 정부"'s MDIS sites "2018 The Report on the Digital Divide "



- 25 questionnaires, questionnaires for classification(age, job, education)

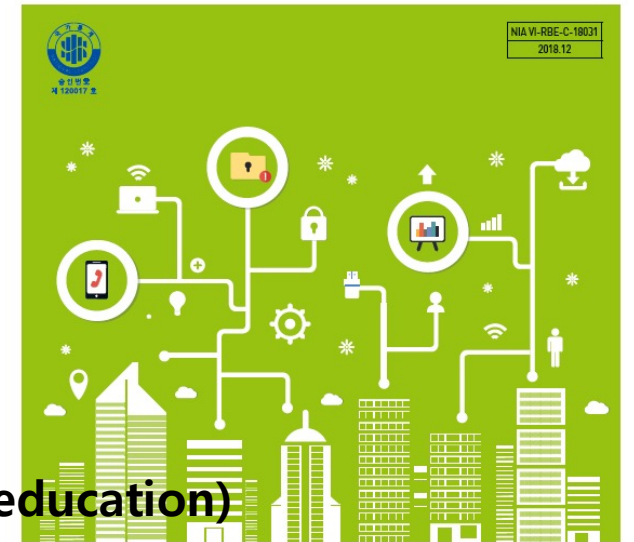
3) 표본크기

총 15,000명 (유효 표본 기준)

- 일반국민 7,000명(만55세 이상 장노년층 2,300명 포함)
- 장애인, 저소득층, 농어민 각 2,200명
- 북한이탈주민, 결혼이민자 각 700명

5) 조사 방법

- 구조화된 설문에 의한 대인 면접조사 (Face to Face Interview)



2018 디지털정보격차
The Report on the Digital Divide
실태조사

Data

- Unstructured data

- Identification of the need for digital education for the elderly, the reasons for the difficulties of the elderly, and the needs of the elderly with qualitative data
- Identify the current distribution of educational institutions by creating location data of education institutions for senior citizens across the country

교육기관 이름	Latitude	Longitude
동작노인종합복지관	37.500362	126.9291703
유린원광종합사회복지관	37.6041626	127.096064
등촌1종합사회복지관	37.564004	126.8423724
구로노인종합복지관	37.5051796	126.8906187
노원1종합사회복지관	37.6300007	127.0600986
감만종합사회복지관	35.1184716	129.0813587
부산광역시장노년일자리지원센터	35.1874393	129.0724586
(사)한국복지정보통신협의회 대구경북지부	35.8875531	128.6251337
(사)한국고령자정보화교육협의회 대구지부	35.8714354	128.601445
만월종합사회복지관	37.4635746	126.7255996
인천광역시서구연회노인문화센터	37.5461861	126.6718733
광주공원노인복지관	35.14747	126.9079694
한국복지정보통신협의회 대전충남	36.3842187	127.3619041

Research Methods

- Deriving digital informatization level using average and weight
- Correlation analysis, `corrplot()`
- Cross analysis, independence test, `mosaicplot()`
- Regression analysis, regression graph using `ggplot()`
- Equal variance test (`Bartlett.test()`), analysis of variance (ANOVA), post hoc test (`TukeyHSD`), `boxplot()`
- Two-group mean analysis (`t.test()`), probability density function using `dnorm`
- Frequency analysis (`table()`)
- `wordcloud2` for qualitative analysis
- Leverage tableau geometries with GIS data



Digital Informalization Level

○ 디지털정보화 수준(종합) = 디지털정보접근수준(0.2) + 디지털정보역량수준(0.4)

+ 디지털정보활용수준(0.4)

- 접근수준 = 유무선 정보기기 보유여부(0.5) + 인터넷상시 접속가능 여부(0.5)
- 역량수준 = PC 이용능력(0.5) + 모바일 기기 이용능력(0.5)
- 활용수준 = 유선 및 모바일 인터넷 이용여부(0.4) + 인터넷 서비스 이용 다양성(0.4)
+ 인터넷 심화 활용정도(0.2)

2) 부문별 측정항목 및 산출방식

가. 디지털정보화 접근 수준

- 측정 내용 - 디지털정보화 접근 수준은 '유무선 정보기기 보유여부'와 '인터넷 상시 접속가능여부'로 측정됨
- 산출 방식 - 2개 항목간 가중치는 5:5이며, 항목별 점수는 100점 기준으로 산출됨

나. 디지털정보화 역량 수준

- 측정 내용 - 디지털정보화 역량 수준은 '컴퓨터 이용능력'과 '모바일 기기 이용능력'으로 측정됨
- 산출 방식 - '컴퓨터 이용능력'과 '모바일 기기 이용능력'의 가중치는 5:5이며 항목별 점수는 100점 기준으로 산출됨

다. 디지털정보화 활용 수준

- 측정 내용 - 디지털정보화 활용 수준은 '유선 및 모바일 인터넷 이용여부', '인터넷 서비스 이용 다양성', '인터넷 심화 활용정도'로 측정됨
- 산출 방식 - 3개 항목간 가중치는 4:4:2이며 항목별 점수는 100점 기준으로 산출됨

```
##### 활용수준가중치 #####

### 유선 및 모바일 인터넷 이용여부(0.4)

md$Q7IntYes[md$은7.. 귀하께서는, 최근, 인터넷을, 언제, 이용하셨습니다, ==1]<-0.4
md$Q7IntYes[md$은7.. 귀하께서는, 최근, 인터넷을, 언제, 이용하셨습니다, ==2]<-0
md$Q7IntYes[md$은7.. 귀하께서는, 최근, 인터넷을, 언제, 이용하셨습니다, ==3]<-0

### 인터넷 서비스 이용 다양성(0.4)

## Q8 ##
md$Q8PCmean<- (md$은8... 검색, 및, 이메일.. 콘텐츠, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과
+md$은8... 검색, 및, 이메일.. 콘텐츠, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과,
+md$은8... 검색, 및, 이메일.. 콘텐츠, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과,
+md$은8... 검색, 및, 이메일.. 콘텐츠, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과,
)/4
md$Q8PHmean<- (md$은8... 검색, 및, 이메일.. 콘텐츠, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과,
+md$은8... 검색, 및, 이메일.. 콘텐츠, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과,
+md$은8... 검색, 및, 이메일.. 콘텐츠, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과,
+md$은8... 검색, 및, 이메일.. 콘텐츠, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과,
)/4

table(is.na(md$Q8PCmean))
table(is.na(md$Q8PHmean))

## Q9 ##
md$Q9PCmean<- (md$은9... 사회관계, 및, 정보공유, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과,
+md$은9... 사회관계, 및, 정보공유, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과,
+md$은9... 사회관계, 및, 정보공유, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과,
+md$은9... 사회관계, 및, 정보공유, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과,
+md$은9... 사회관계, 및, 정보공유, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과,
)/5
md$Q9PHmean<- (md$은9... 사회관계, 및, 정보공유, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과,
+md$은9... 사회관계, 및, 정보공유, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과,
+md$은9... 사회관계, 및, 정보공유, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과,
+md$은9... 사회관계, 및, 정보공유, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과,
+md$은9... 사회관계, 및, 정보공유, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과,
)/5

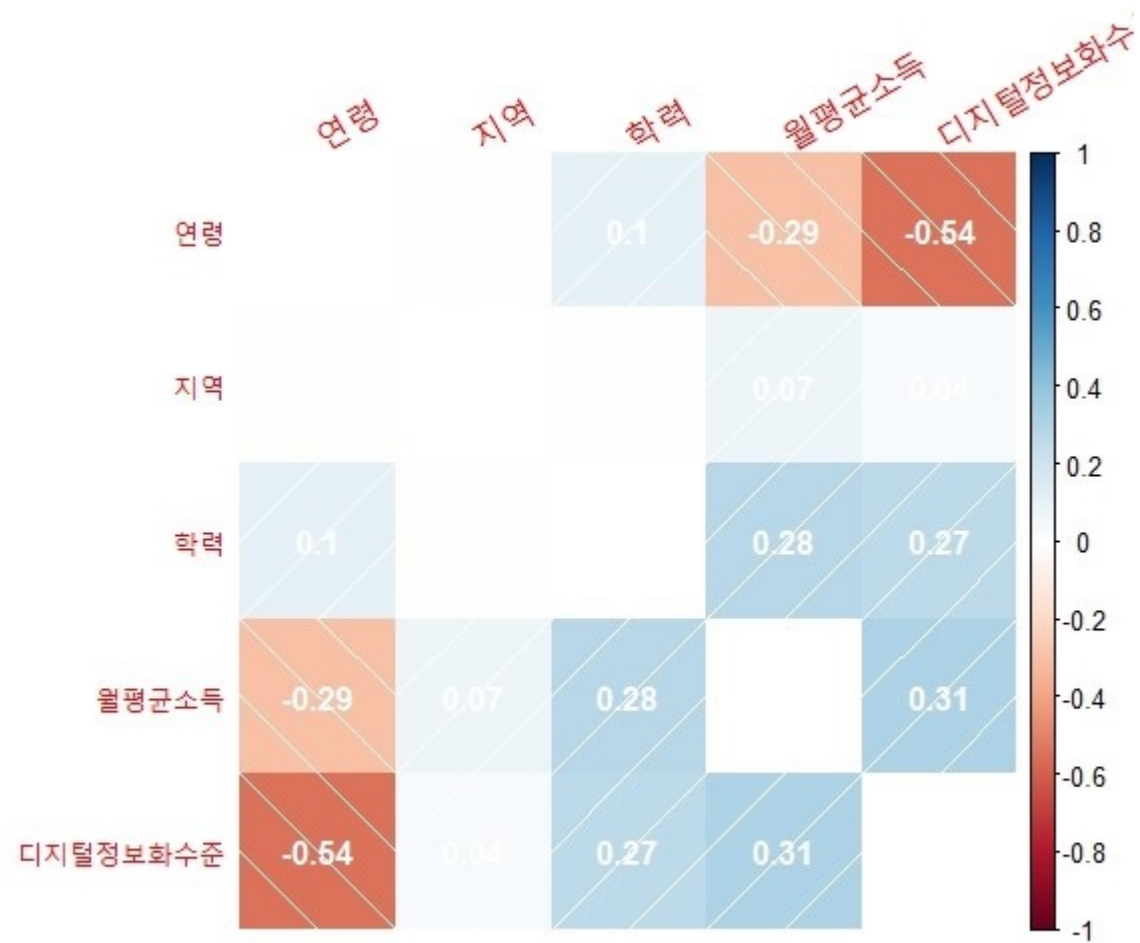
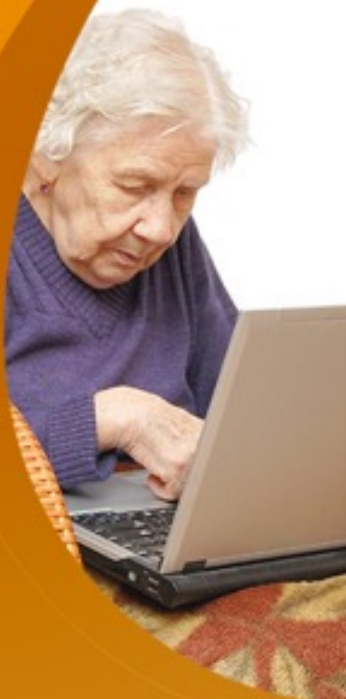
## Q10 ##
md$Q10PCmean<- (md$은10... 생활, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과, 같은, 서비스들,
+md$은10... 생활, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과, 같은, 서비스들,
+md$은10... 생활, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과, 같은, 서비스들,
+md$은10... 생활, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과, 같은, 서비스들,
+md$은10... 생활, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과, 같은, 서비스들,
)/5
md$Q10PHmean<- (md$은10... 생활, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과, 같은, 서비스들,
+md$은10... 생활, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과, 같은, 서비스들,
+md$은10... 생활, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과, 같은, 서비스들,
+md$은10... 생활, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과, 같은, 서비스들,
+md$은10... 생활, 서비스.. 귀하께서는, 최근, 1년, 동안, 다음과, 같은, 서비스들,
)/5

md$Wei2<- (md$Q8PCmean+md$Q8PHmean+md$Q9PCmean+md$Q9PHmean+md$Q10PCmean+md$Q10PHmean)/
```




Analysis for
the reasons

1. Correlation with digital informalization level



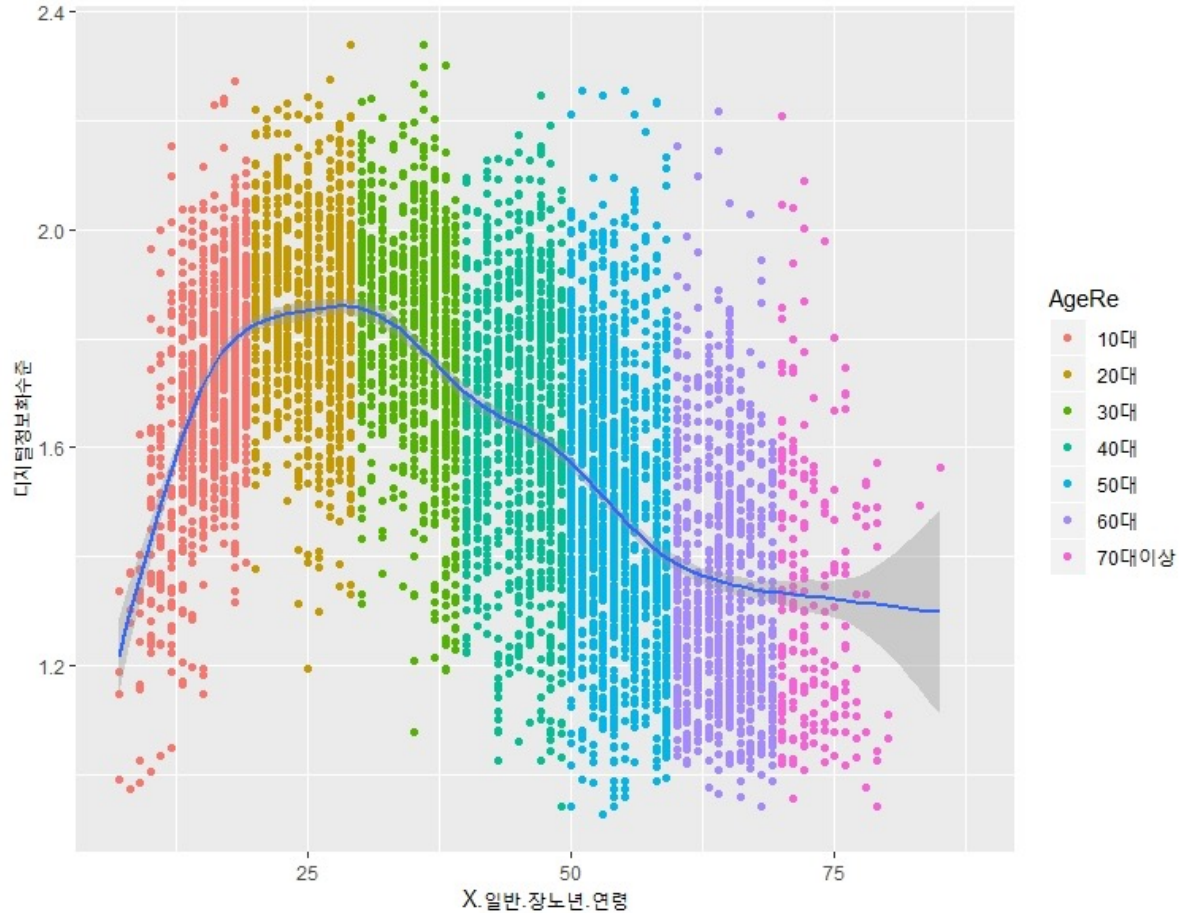
Identify the factors that have the greatest correlation with the level of digital informatization

→ Age and digital informatization level showed a correlation of -0.54, with the largest negative correlation. In other words, the higher the age, the lower the level of digital informatization.

→ The average monthly income and age were -0.29, indicating a weak negative correlation. In other words, the higher the age, the lower the average monthly income.

→ The average monthly income and digital informatization level were 0.31, indicating a weak positive correlation. In other words, the higher the average monthly income, the higher the level of digital informatization.

2. Regression analysis on age and digital informalization level

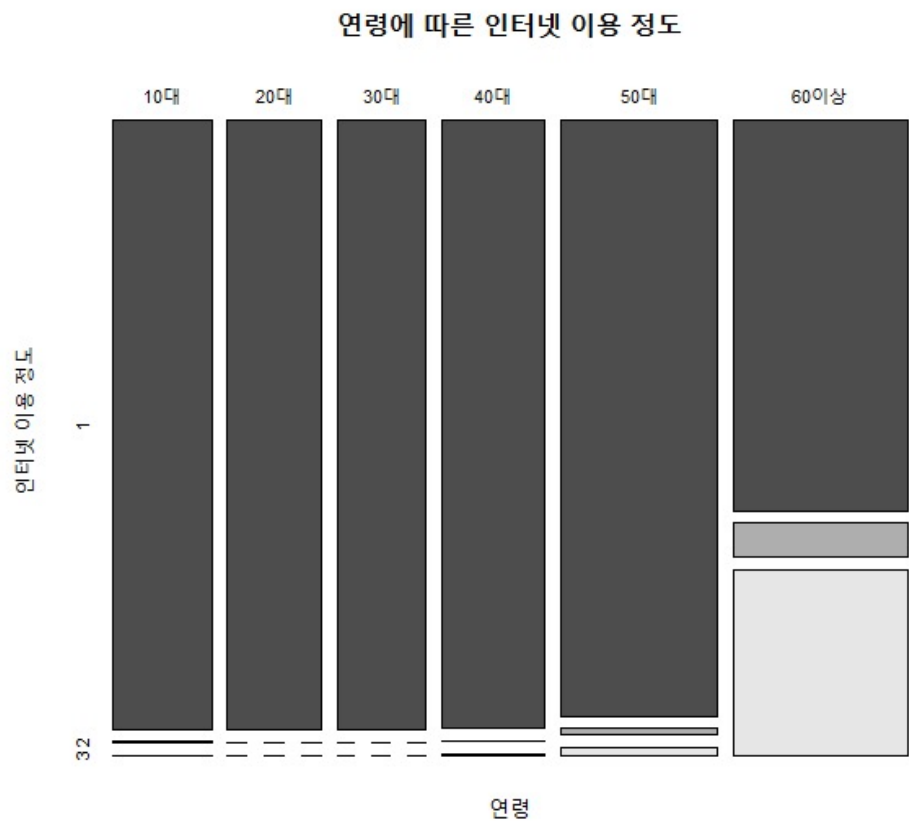


Identification of the influence on the level of digital informatization using the age with the strongest correlation as a factor

→ As the age increases, the level of digital informatization decreases.

→ The level of informatization increases until the 20s, decreases rapidly from the 30s, and remains low from the 60s.


3. Digital informalization level among generations



Cross-analysis of Internet Use by Generation

- Degree of Internet use
 - Used within the last month
 - I have been using the internet for over a month
 - never used the internet
- Generation
 - teenager
 - 20's
 - 30's
 - 40's
 - 50's
 - over 60
- It can be seen that the number of non-internet users and those who do not use the Internet rapidly increases from those in their 60s or older.

3. Digital informalization level among generations



```
> describeBy(y ~ x, na.rm=T, mat=T)
```

	item	group1	ars	mean	sd	median	trimmed	mad	min
x11	1	10대	1 966	2.353139	0.3146207	2.401333	2.380305	0.2931135	1.173333
x12	2	20대	1 915	2.547520	0.2510426	2.581690	2.564639	0.2393340	1.537714
x13	3	30대	1 864	2.458350	0.3075648	2.496452	2.483792	0.2890717	1.364095
x14	4	40대	1 1012	2.221410	0.3570704	2.261321	2.239849	0.3684614	1.140000
x15	5	50대	1 1495	1.988112	0.3857628	1.989690	1.986262	0.4095859	1.140000
x16	6	60이상	1 1093	1.789458	0.3728469	1.725762	1.765754	0.4314013	1.140000

	max	range	skew	kurtosis	se
x11	3.073333	1.900000	-0.83753792	0.8065038	0.010122754
x12	3.140000	1.602286	-0.65135425	0.3344544	0.008299213
x13	3.140000	1.775905	-0.72568379	0.2726385	0.010463568
x14	2.961071	1.821071	-0.42917524	-0.3428023	0.011224413
x15	3.057000	1.917000	0.06300714	-0.5804282	0.009976996
x16	2.953000	1.813000	0.51889301	-0.5782122	0.011277699

```
> bartlett.test(y ~ x, data=aa)
```

Bartlett test of homogeneity of variances

data: y by x
Bartlett's K-squared = 242.52, df = 5, p-value < 2.2e-16

```
> oneway.test(y ~ x, data=aa, var.equal = FALSE)
```

One-way analysis of means (not assuming equal variances)

data: y and x
F = 827.05, num df = 5.0, denom df = 2867. , p-value < 2.2e-16

ANOVA Analysis of Internet Use by Generation

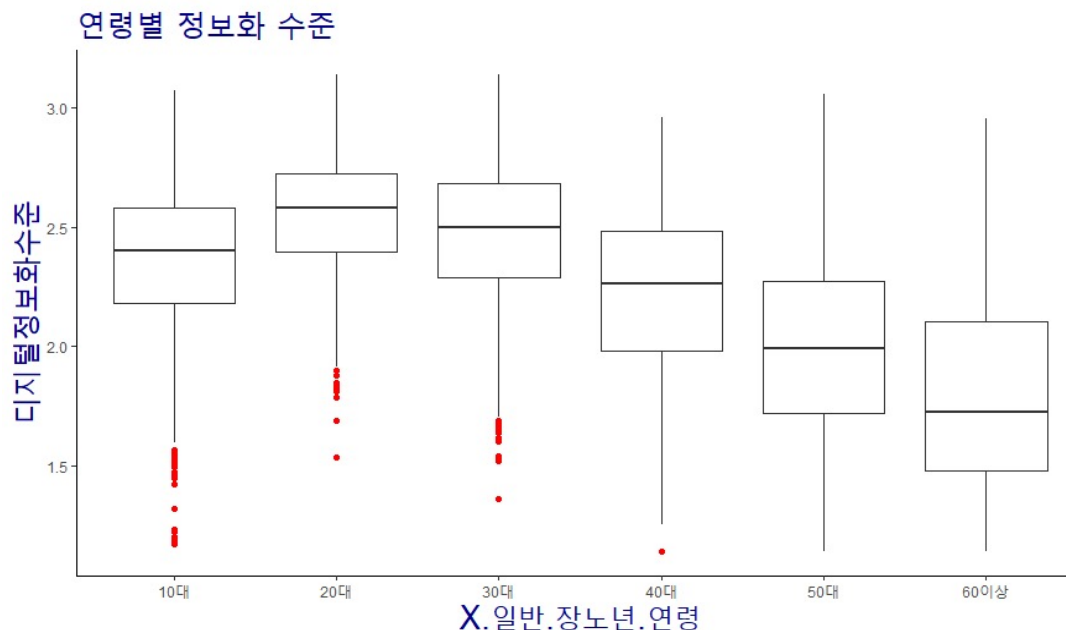
→ Check the average digital informatization level by generation through describeBy().

→ Test for equality of variance with Bartlett.test() for ANOVA. As the test result did not satisfy equal variance, heterogeneous variance analysis was performed.

→ One-way analysis of variance is carried out in heteroscedastic form. $P < 0.05 \Rightarrow$ There is a difference between groups.

3. Digital informalization level among generations

#	Estimator	Lower	Upper	Statistic	p.Value
2 - 1	0.150	0.121	0.178	14.803	0.000000e+00
3 - 1	0.081	0.049	0.112	7.284	1.942557e-12
4 - 1	-0.095	0.126	-0.064	-8.674	2.220446e-16
5 - 1	-0.245	0.272	-0.218	-24.875	0.000000e+00
6 - 1	-0.354	0.380	-0.328	-35.438	0.000000e+00
3 - 2	-0.069	0.099	-0.039	-6.523	3.583923e-10
4 - 2	-0.245	0.273	-0.216	-23.453	0.000000e+00
5 - 2	-0.395	0.419	-0.370	-41.705	0.000000e+00
6 - 2	-0.504	0.526	-0.480	-51.228	0.000000e+00
4 - 3	-0.176	0.207	-0.144	-15.470	0.000000e+00
5 - 3	-0.326	0.353	-0.298	-31.220	0.000000e+00
6 - 3	-0.435	0.461	-0.408	-40.681	0.000000e+00
5 - 4	-0.150	0.178	-0.122	-15.020	0.000000e+00
6 - 4	-0.259	0.286	-0.232	-25.816	0.000000e+00
6 - 5	-0.109	0.133	-0.084	-12.603	0.000000e+00



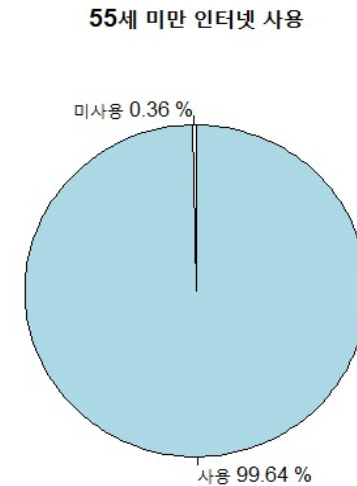
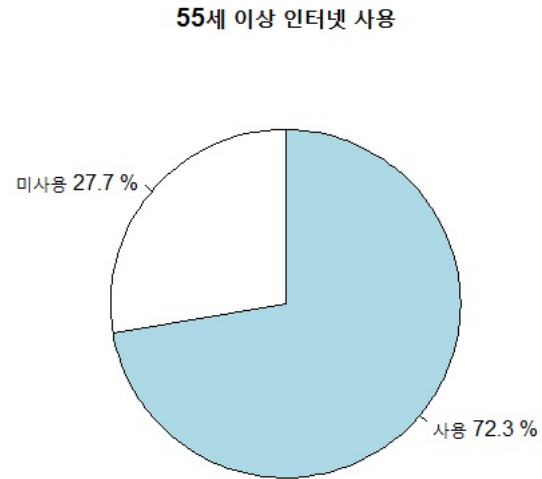
Post-test of Internet use by generation

→ A post-hoc test was performed to see the difference in the average of the accurate digital informatization level between groups with TukeyHSD. Confirm that there is a significant difference in mean between all generations.

→ Visualize with barplot(). It can be seen that the level of informatization is the highest for those in their 60s or older and those in their 20s.

→ 20's > 30's > 10's > 40's > 50's > 60's and above.

4. Factors that affect elderly's digital informalization level



Comparison of Internet use between the elderly and non-old age groups, who had the lowest level of informatization

→ While the Internet non-use rate for those under 55 years old converges to almost 0%, it is confirmed that the Internet non-use rate for those over 55 years old is close to 28%.

4. Factors that affect elderly's digital informalization level

1) Sex

```
> bartlett.test(y ~ x, data=a55)

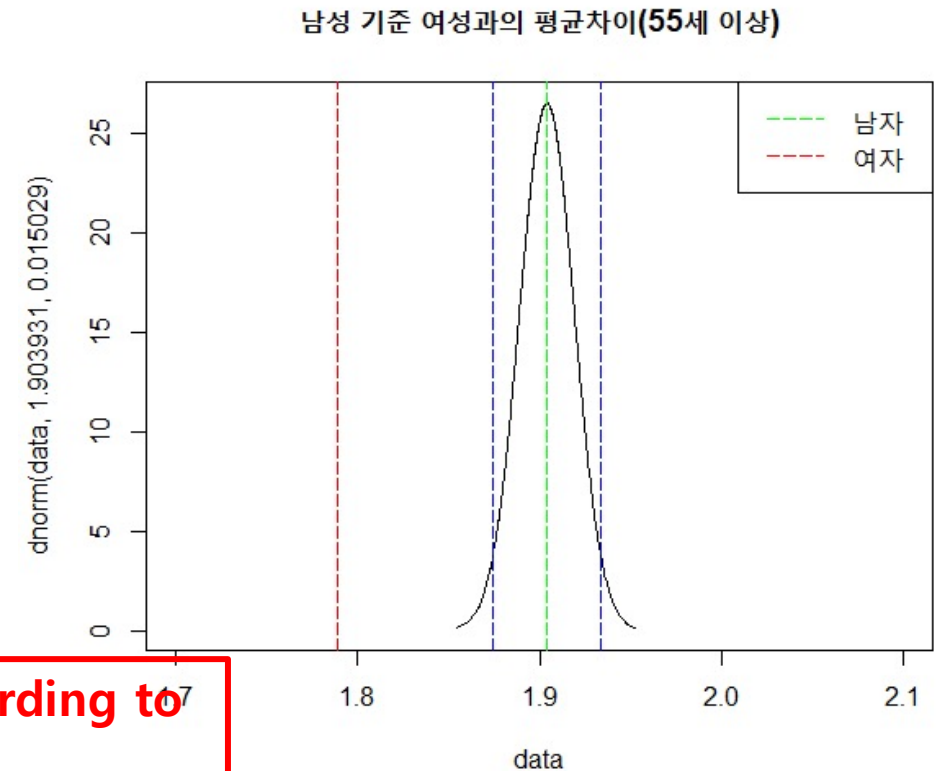
Bartlett test of homogeneity of variances

data: y by x
Bartlett's K-squared = 3.3937, df = 1, p-value = 0.06545
```

```
> t.test(y ~ x, data=a55, var.equal = FALSE)

Welch Two Sample t-test

data: y by x
t = 5.9695, df = 1423, p-value = 2.999e-09
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 0.07714956 0.15266964
sample estimates:
mean in group 남자 mean in group 여자
      1.903931      1.789021
```



The digital informatization index differs according to the gender of the elderly.

→ Equal variance test is performed to compare the means of the two groups. Since $P > 0.05$, equal variance is satisfied

→ As a result of `t.test()`, older females had a lower level of digitalization than males.

4. Factors that affect elderly's digital informalization level

2) Income level

```
> bartlett.test(y ~ x, data=cc)

Bartlett test of homogeneity of variances

data: y by x
Bartlett's K-squared = 10.535, df = 6, p-value = 0.1038
```

```
> aaResult <- aov(y ~ x, data=cc)
> summary(aaResult)

          Df Sum Sq Mean Sq F value    Pr(>F)    
x             6   18.63   3.1043   22.77 <0.0000000000000002 ***
Residuals  1621  221.01   0.1363                

---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
620 observations deleted due to missingness
```

```
> describeBy(cc$디지털정보화수준, cc$x_일반.장노년.가구.월평균.소득, na.rm=T, mat=T)

iter group1 vars n mean sd median trimmed mad min
x11 100만대 1 32 1.701362 0.3594795 1.585524 1.668410 0.3296314 1.140000
x12 100만미만 1 56 1.686470 0.4180135 1.537667 1.652491 0.3659551 1.239476
x13 200대 1 41 1.782919 0.3615901 1.709714 1.755960 0.3657609 1.174667
x14 300대 1 35 1.871929 0.3474499 1.835000 1.860695 0.4009374 1.184976
x15 400대 1 24 1.939597 0.3860234 1.912238 1.923046 0.4238118 1.160000
x16 500대 1 15 1.972483 0.3802082 1.941810 1.970881 0.4353549 1.217143
x17 600이상 1 7 2.080068 0.4333168 2.104714 2.071790 0.3695557 1.226667

max range skew kurtosis se
x11 2.909667 1.769667 0.76726188 -0.2210677 0.01994033
x12 2.600000 1.360524 0.69179402 -1.1030152 0.05585940
x13 2.933738 1.759071 0.63528092 -0.4119838 0.01768595
x14 2.818429 1.633452 0.28626477 -0.5710703 0.01841481
x15 3.012000 1.852000 0.36073882 -0.4685786 0.02456208
x16 3.019595 1.802452 0.12990300 -0.6643217 0.03073801
x17 3.057000 1.830333 0.09036683 -0.5720388 0.05071589
```

The level of digital informatization differs according to the income level of the elderly.


→ Equal variance test is performed to compare the means of three or more groups. Since $P > 0.05$, equal variance is satisfied.

→ As a result of ANOVA, it was confirmed that there is a difference according to income level.

→ Check the average of digital informatization level by income with describeBy().

4. Factors that affect elderly's digital informalization level

2) Income level



```
> TukeyHSD(aaResult)
Tukey multiple comparisons of means
95% family-wise confidence level

Fit: aov(formula = y ~ x, data = cc)

$x
      diff      lwr      upr      p adj
100만미만-100만대 -0.01489173 -0.1726019147 0.1428185 0.9999618
200대-100만대 0.08155769 0.0009460909 0.1621693 0.0452386
300대-100만대 0.17056710 0.0869413865 0.2541928 0.0000000
400대-100만대 0.23823524 0.1462240162 0.3302465 0.0000000
500대-100만대 0.27112150 0.1642505883 0.3779924 0.0000000
600이상-100만대 0.37870598 0.2375265592 0.5198854 0.0000000
200대-100만미만 0.09644942 -0.0586606464 0.2515595 0.5239780
300대-100만미만 0.18545883 0.0287611498 0.3421565 0.0088380
400대-100만미만 0.25312697 0.0917982122 0.4144557 0.0000799
500대-100만미만 0.28601322 0.1157713579 0.4562551 0.0000161
600이상-100만미만 0.39359770 0.1999678244 0.5872276 0.0000001
300대-200대 0.08900941 0.0103971453 0.167621 0.0148590
400대-200대 0.15667755 0.0691978749 0.244157 0.0000029
500대-200대 0.18956381 0.0865685671 0.292559 0.0000013
600이상-200대 0.29714828 0.1588795038 0.435417 0.0000000
400대-300대 0.06766814 -0.0225965987 0.1579329 0.2889002
500대-300대 0.10055440 -0.0048166089 0.2059254 0.0727605
600이상-300대 0.20813888 0.0680914359 0.3481863 0.0002461
500대-400대 0.03288626 -0.0792558629 0.1450284 0.9774961
600이상-400대 0.14047073 -0.0047397726 0.2856812 0.0655164
600이상-500대 0.10758448 -0.0474684728 0.2626374 0.3845226
```

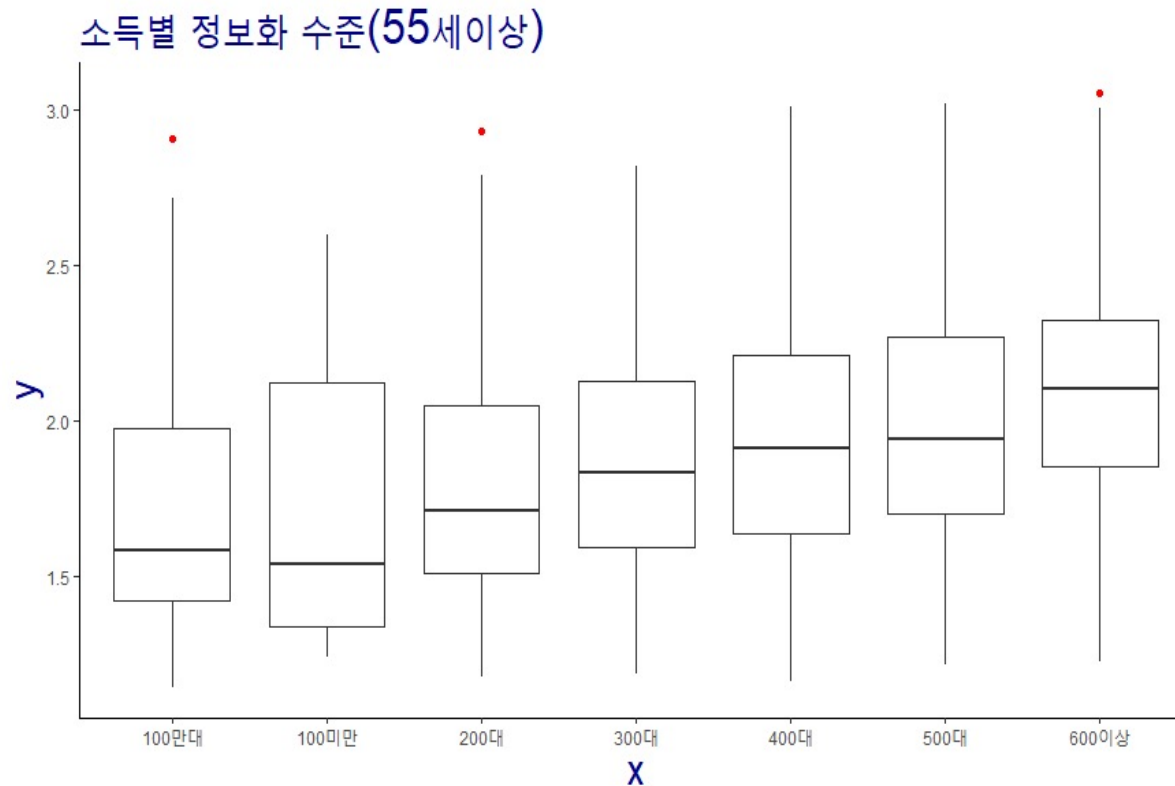
A post-hoc test was carried out to compare the differences in digital informatization level between the income levels of the elderly.

→ The difference between the level of digital informatization between the elderly with a monthly income of more than 6 million won and those with a monthly income of less than 1 million won was the largest.

→ The greater the difference in monthly income, the lower the P value, and therefore the greater the difference in income, the greater the difference in the informatization index.

4. Factors that affect elderly's digital informalization level

2) Income level



A post-hoc test was carried out to compare the differences in digital informatization level between the income levels of the elderly.

→ The higher the income level, the higher the level of informatization.

4. Factors that affect elderly's digital informalization level

3) Education

```
> bartlett.test(y ~ x, data=a55)

Bartlett test of homogeneity of variances

data: y by x
Bartlett's K-squared = 5.5581, df = 3, p-value = 0.1352
```

```
> aaResult <- aov(y ~ x, data=a55)
> summary(aaResult)
```

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
x	3	36.9	12.302	96.26	<0.0000000000000002 ***
Residuals	1661	212.3	0.128		

```
> TukeyHSD(aaResult)
Tukey multiple comparisons of means
95% family-wise confidence level

Fit: aov(formula = y ~ x, data = a55)

$x
      diff      lwr      upr      p adj
중졸-초졸이하 0.02294871 -0.06256536 0.1084628 0.9008969
고졸-초졸이하 0.18082537 0.10124927 0.2604015 0.0000000
대졸-초졸이하 0.57708634 0.46985781 0.6843149 0.0000000
고졸-중졸      0.15787666 0.10487055 0.2108828 0.0000000
대졸-중졸      0.55413763 0.46483338 0.6434419 0.0000000
대졸-고졸      0.39626097 0.31262516 0.4798968 0.0000000
```

It was confirmed that there is a difference in the level of digital informatization by educational background of the elderly.

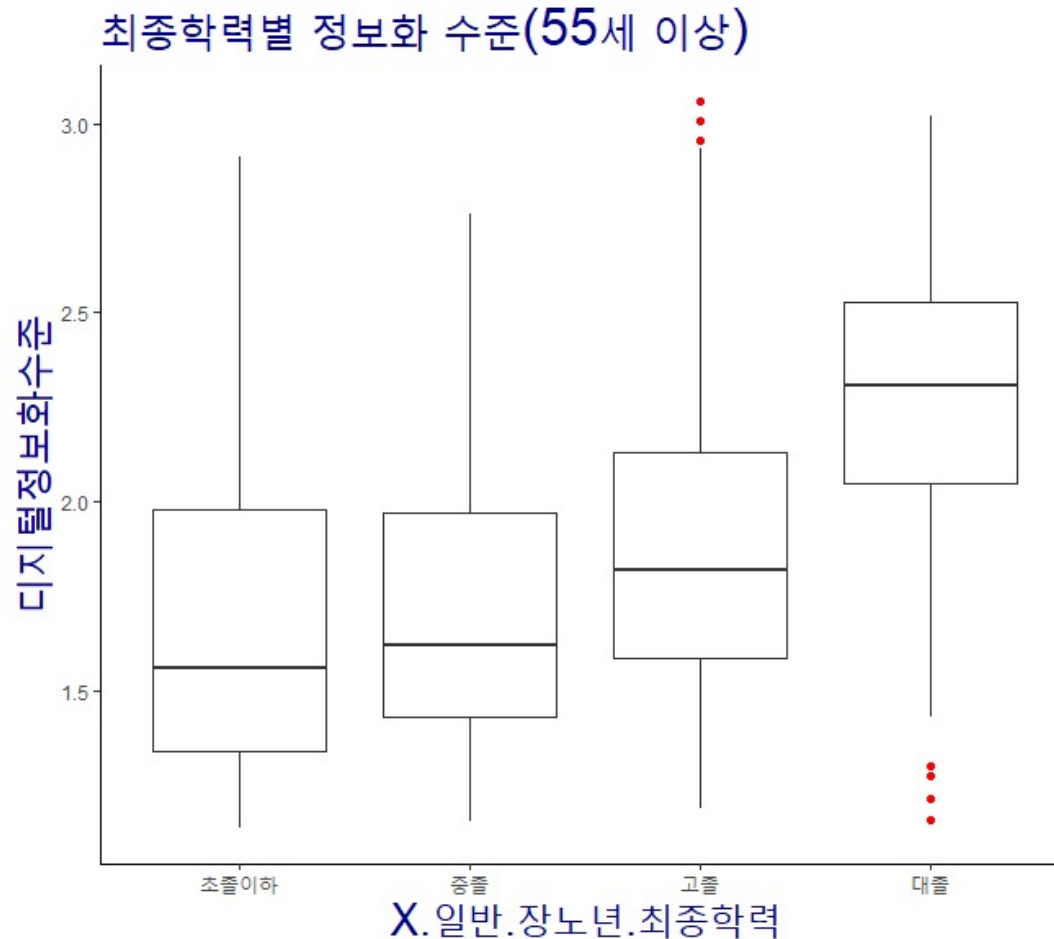
→ Check the equality of variance with Bartlett.test() to compare the means of three or more groups. Since $P > 0.05$, equal variance is satisfied.

→ ANOVA analysis confirmed that there was a difference in the mean between groups.

→ Through the TukeyHSD() post-test method, it was confirmed that the difference in digital informatization level between college graduates and elementary school graduates was the largest.

4. Factors that affect elderly's digital informalization level

3) Education




It was confirmed that there is a difference in the level of digital informatization by educational background of the elderly.

→ University graduates have the highest level of digital informatization, and the higher their educational background, the higher the level of digital informatization.

4. Factors that affect elderly's digital informalization level

4) Region



```
> bartlett.test(a55$디지털정보화수준~a55$x. 일반. 장노년. 지역구분1)

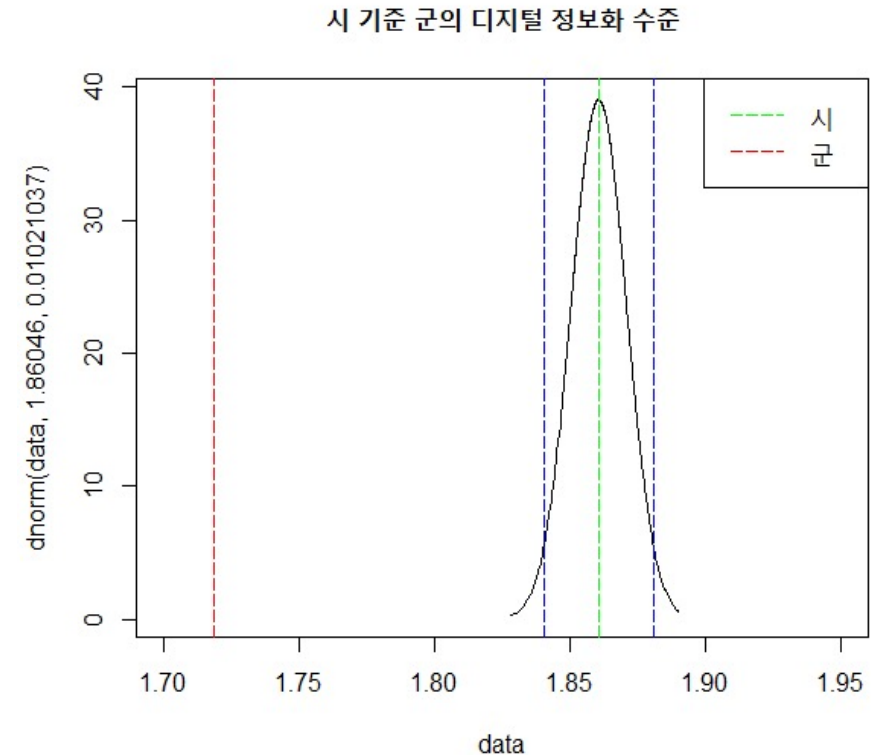
Bartlett test of homogeneity of variances

data: a55$디지털정보화수준 by a55$x. 일반. 장노년. 지역구분1
Bartlett's K-squared = 0.34916, df = 1, p-value = 0.5546
```

```
> t.test(a55$디지털정보화수준 ~ x. 일반. 장노년. 지역구분1, data=a55)

Welch Two Sample t-test

data: a55$디지털정보화수준 by x. 일반. 장노년. 지역구분1
t = 5.421, df = 330.24, p-value = 1.146e-07
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 0.09058384 0.19377025
sample estimates:
mean in group 시 mean in group 군
1.860460          1.718283
```




It is confirmed that the level of digital informatization by region remains different in the lives of senior citizens.

→ Check the equality of variance with Bartlett.test() to compare the means of two or more groups. Since $P > 0.05$, equal variance is satisfied.

→ Through t.test() analysis, it was found that there is a difference in the level of digital informatization between the elderly living in the city and those living in the gu.

5. Level of satisfaction according to elderly's usage of internet



```
> bartlett.test(a55$문22평균~a55$문7dum)

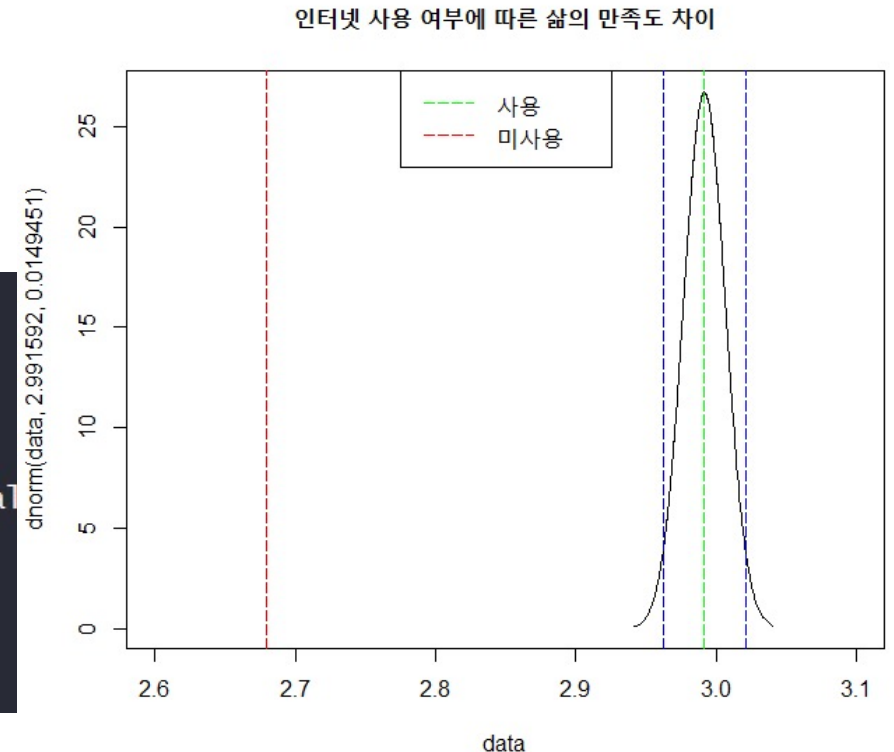
Bartlett test of homogeneity of variances

data: a55$문22평균 by a55$문7dum
Bartlett's K-squared = 1.768, df = 1, p-value = 0.1836
```

```
> t.test(a55$문22평균~a55$문7dum)

Welch Two Sample t-test

data: a55$문22평균 by a55$문7dum
t = 10.652, df = 1110.6, p-value < 2.2e-16
alternative hypothesis: true difference in means is not equal
95 percent confidence interval:
 0.2547202 0.3697527
sample estimates:
mean in group 사용 mean in group 미사용
 2.991592          2.679355
```



Life satisfaction of the elderly differs depending on whether they use the Internet or not.

→ Check the equality of variance with Bartlett.test() to compare the means of two or more groups. Since $P > 0.05$, equal variance is satisfied.

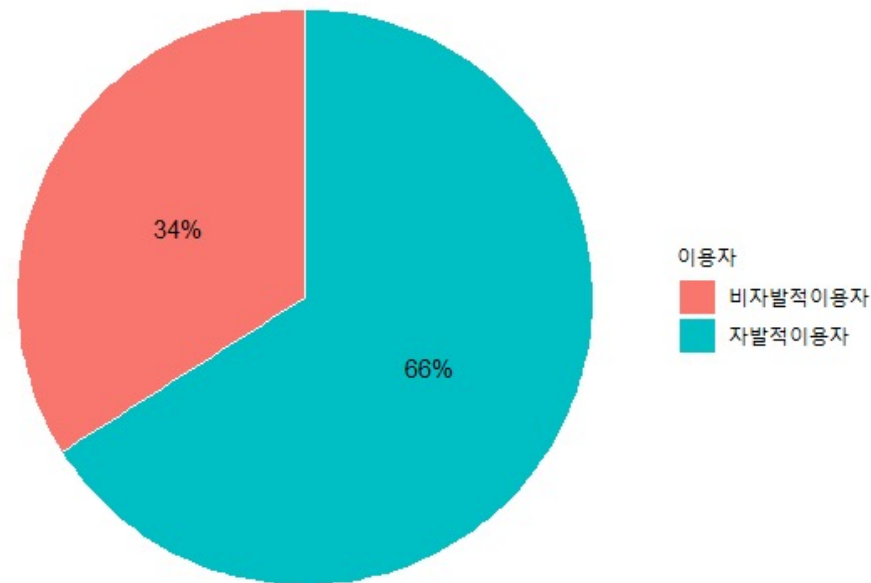
→ Through t.test() analysis, it was confirmed that the elderly who use the Internet have higher life satisfaction than those who do not use the Internet.



Analysis on solutions

1. Elderly who voluntarily doesn't / does use internet

노인의 자발적, 비자발적 비이용자 빈도



Elderly people involuntary Internet non-users Proportion of voluntary Internet non-users

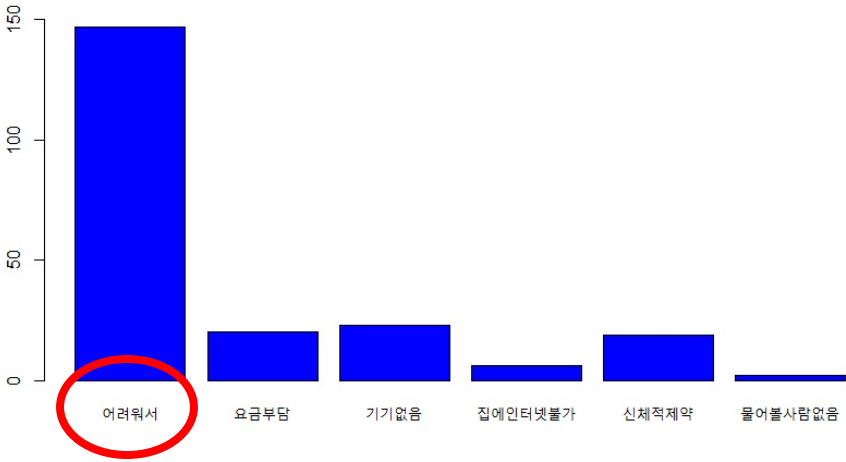
→ At 66%, the proportion of voluntary non-users is high, but non-users account for only 655 of the total 7000 respondents.

→ Even among Internet users, there is a significant difference in the information gap by generation, so it is not a big problem.

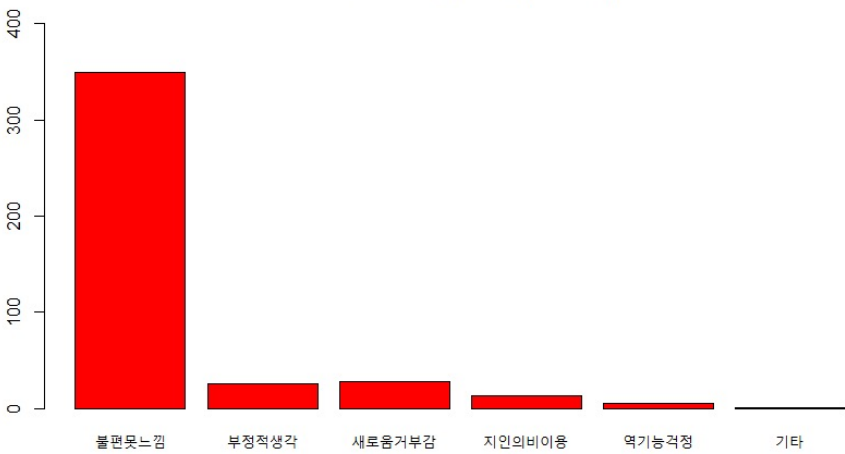
1. Elderly who voluntarily doesn't / does use internet



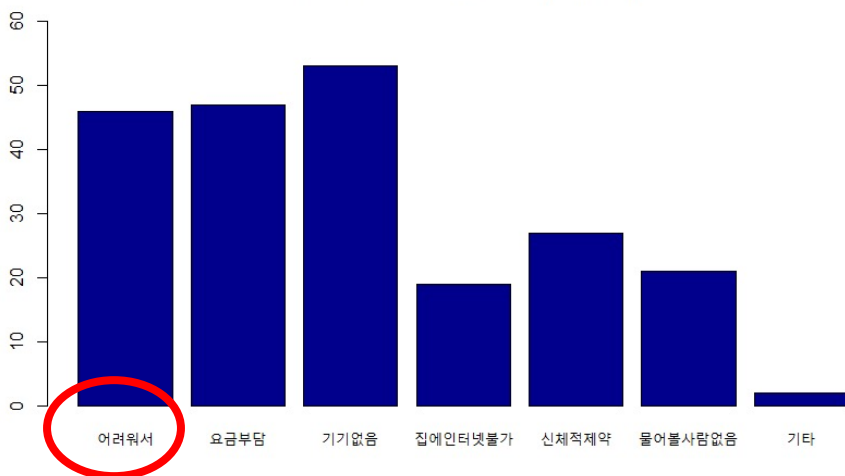
비자발적 비이용자 이유 1순위 (55세 이상)



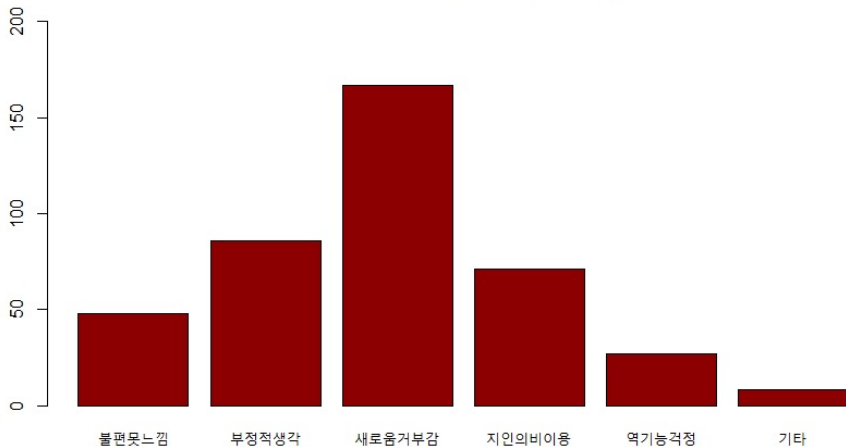
자발적 비이용자 이유 1순위 (55세 이상)



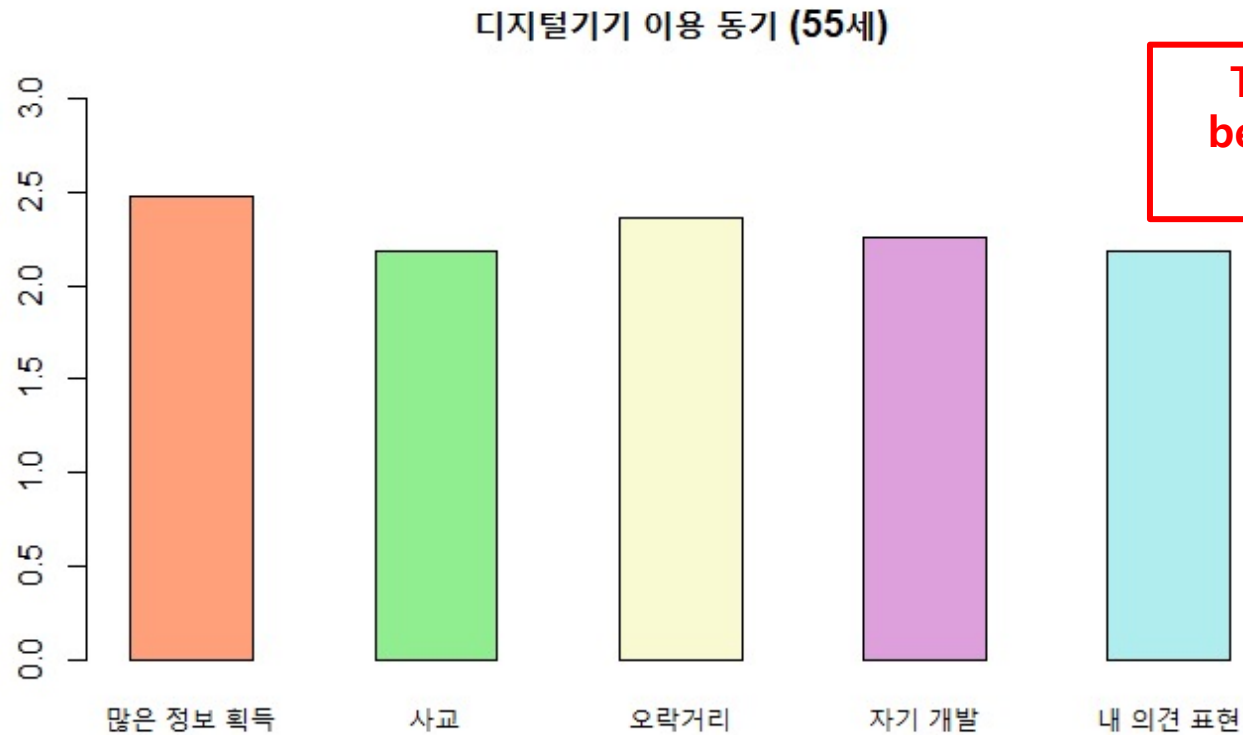
비자발적 비이용자 이유 2순위 (55세 이상)



자발적 비이용자 이유 2순위 (55세 이상)

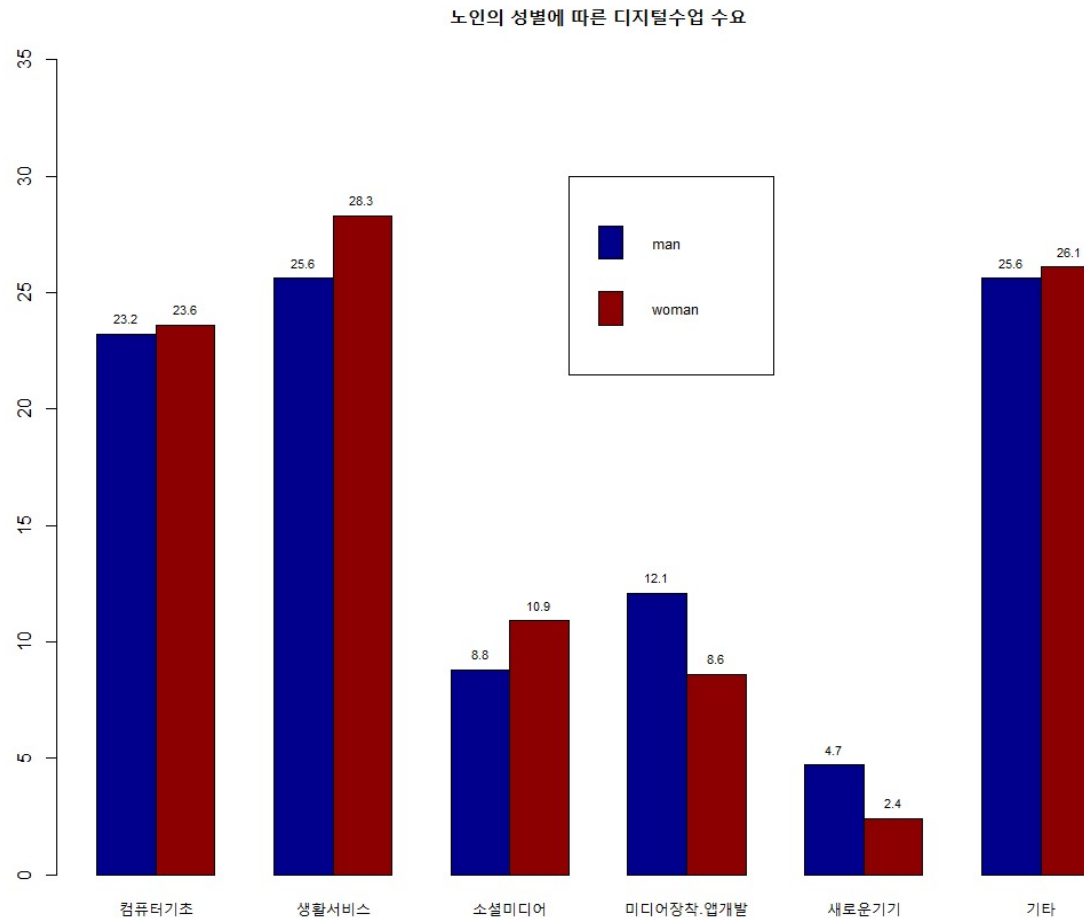


2. Elderly's reasons of using digital devices



There is no significant difference between the motives of the elderly who use digital devices.

3. Supply of digital class according to elderly's sex



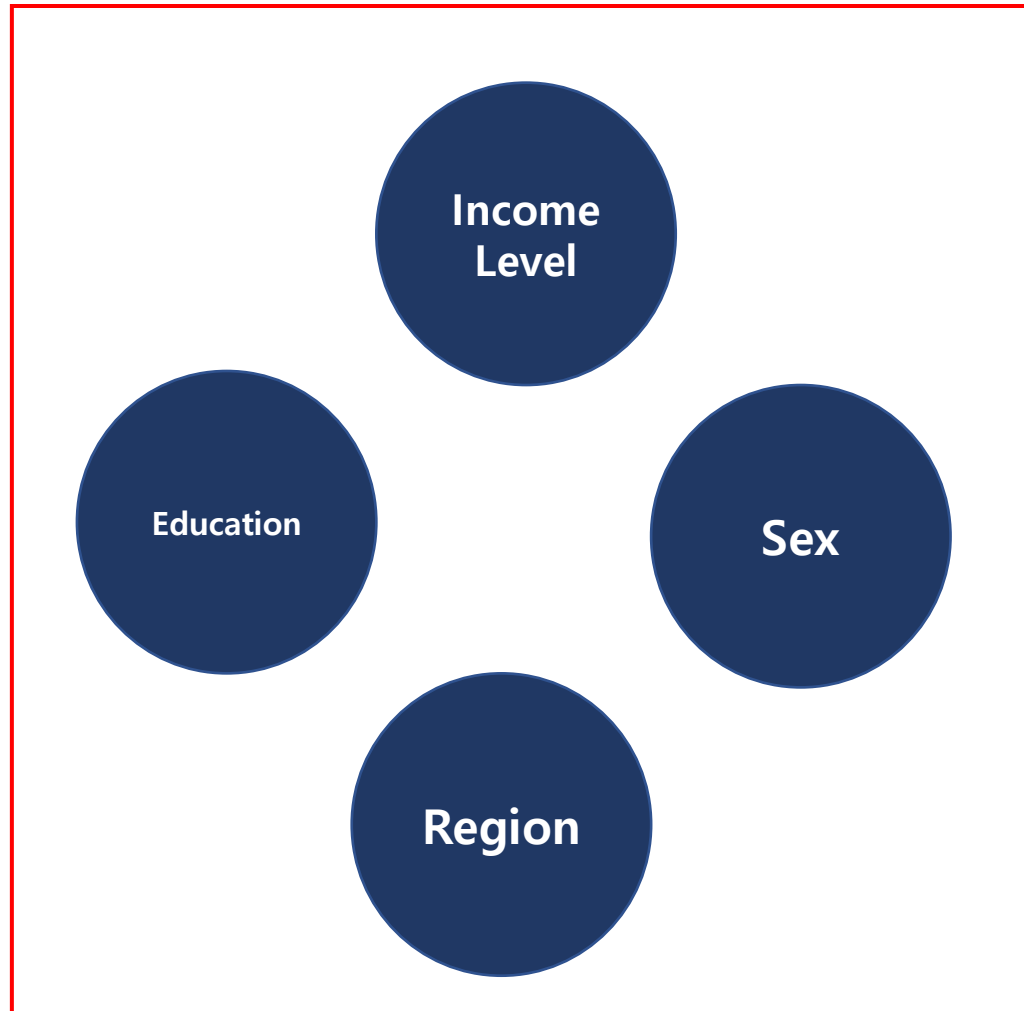
The digital classes they want are not significantly different according to their gender. Most want life services and computer basics the most.

A photograph of an elderly woman with short, curly white hair, wearing a dark blue V-neck sweater. She is seated in a light brown wicker chair, focused on a silver laptop in front of her. Her hands are on the keyboard. The background is plain white. The image is framed by a large, semi-circular orange graphic element that curves around the left and bottom of the photo.

Suggestions of solutions

1. Summary of analysis

Elderly people who are vulnerable to digital informatization



1

Elderly with lower income and education level, who is female, and who lives in the more remoted region showed lower level of digital informatization.



1. Summary of analysis

2

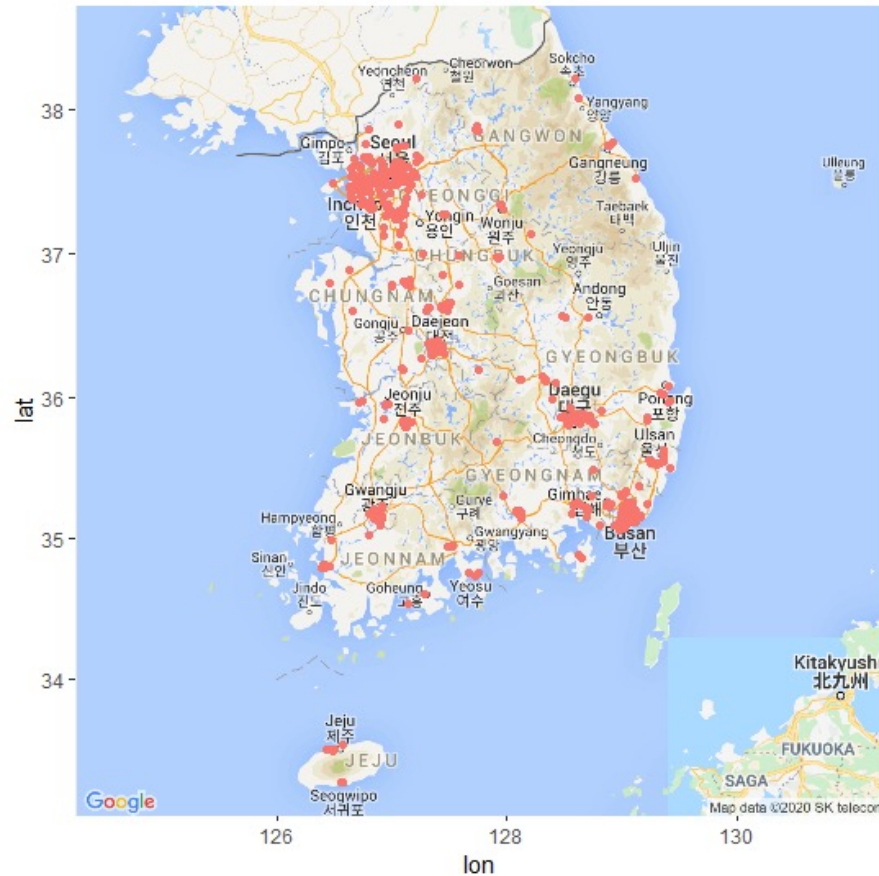
The biggest reason for not being able to use digital devices was "difficulty", and there was no significant difference in the demand for digital classes between genders.

3

Compared to non-users of digital devices, the life satisfaction of the elderly users was higher.

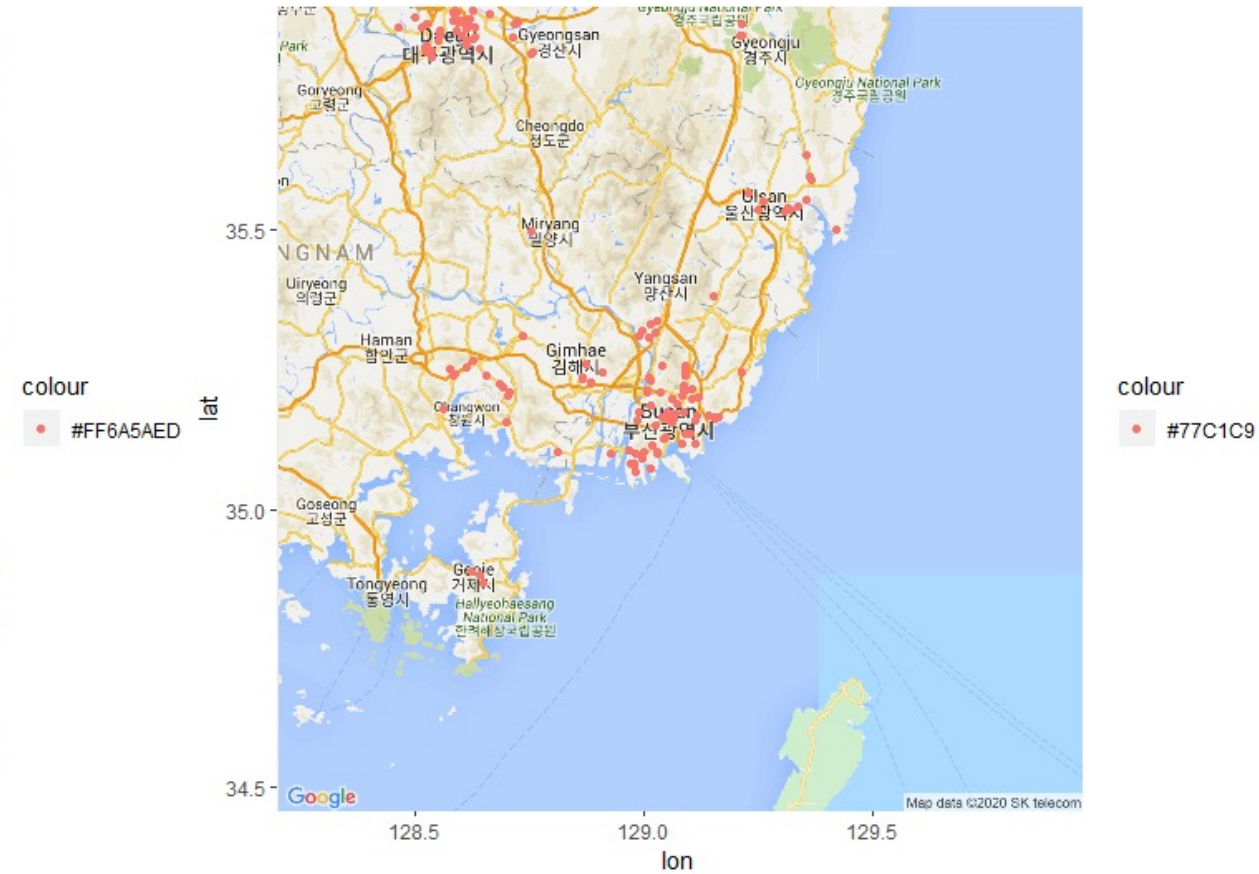
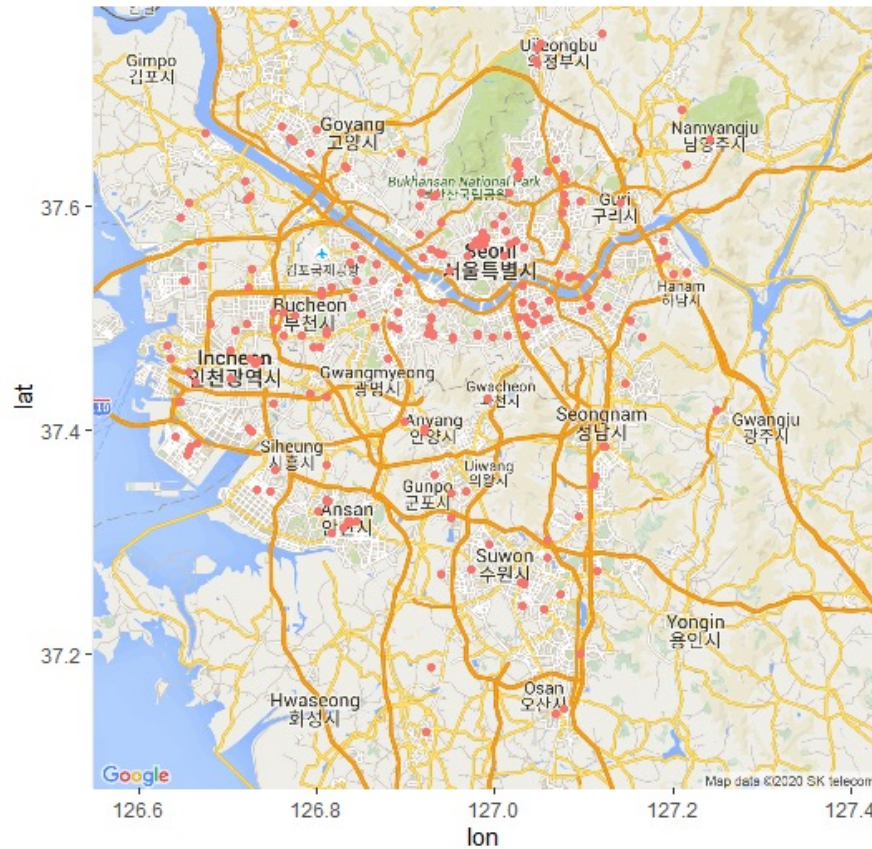


2. Distribution and problems of smart phone education organizations for elderly



Although the number of educational institutions is increasing, most of them are conducted at the city level, not the county level.

2. Distribution and problems of smart phone education organizations for elderly



3. Solution : to supply basic tutorial application for elderly



어르신들이 자주 묻는 스마트폰 사용법 질문 TOP5

- 01 연락처에 새로운 번호 저장하는 방법
- 02 연락처/메신저 어플에 즐겨찾기 등록하는 방법
- 03 메시지/통화목록 삭제하는 방법
- 04 내가 받은 사진을 친구에게 전달하는 방법
- 05 바탕화면 손주사진으로 바꾸는 방법

- **Alternative:** Large smartphone brands such as Samsung and LG distribute basic tutorial apps for the elderly.
- **Methods :**
 - ✓ It translates foreign language apps such as Kakao Talk and Messages into Korean in the basic app.
 - ✓ All tutorials are provided with voice guidance, and you can ask questions through voice recognition.
 - ✓ We provide all means to supplement aging body organs by supporting the same tutorial contents with text, video, and audio.
- **Expected effect:** We provide the necessary information regardless of income, educational background, gender, or location of residence at a lower cost and greater accessibility.
- **Differentiation:** It reduces the cost, including accessibility and time, which are problems of existing educational facilities, and supplements the physical aging of the elderly through voice support and large fonts.



Strength and weakness of research

Strength and weakness of research

Strength

- Existing studies focused on the physical retreat of the elderly and ended up suggesting only technical improvement measures, or concluding that informatization education for the elderly should be further increased. The effectiveness of education through qualitative analysis was also not considered.
- This study analyzed the group that is inevitably more vulnerable within the information vulnerable group called the 'older age group' according to income, educational background, region, and gender.
- In addition, this study looked at the geographic location of educational institutions and the effectiveness of digital information education through qualitative analysis, and presented a new alternative to disseminating the basic tutorial app beyond the conclusion that it is simply necessary to increase the number of educational institutions.



Strength and weakness of research

Weakness

- Since detailed weights are not provided in the report, there is a possibility that there is an error in the calculation method.
- Detailed planning for the realization of the business was practically insufficient.
- As the project is focused on welfare rather than business feasibility, it is expected that there will be difficulties in securing the budget.



Ah!
No! 인과 정보의
Va! 다

Thank you.

