

Index Card Evaluation Study

someonesdad on FPN
24 Jan 2012

This is a summary of some of the things I learned from the index card evaluation (see this [post](#) for details).

The objectives of the study were:

- ◆ Have people stress the papers with their inks and nibs.
- ◆ Determine people's preferences for the papers selected.
- ◆ Determine what people felt were good, average, and gouging (i.e., too high) price levels for these papers.

The main purpose of the study was to help me decide whether I should start a small cottage business supplying paper to fountain pen users. This business would supply a variety of papers that are felt to work well with fountain pens and inks, not just index cards. Most people would probably be more interested in writing paper than index cards. I chose to study index cards to complement a study I did on writing papers a few years ago.

As of this writing, I haven't made the decision yet as to whether to start the business.

I had decided the last day of the study was Friday, 20 January 2012; I would summarize the results at that point. Fortunately, I waited until yesterday (Monday, 23 Jan 2012) to summarize the data -- and three more envelopes containing responses came in the mail, bringing the response rate to 100%! Thanks, everyone!

Table of Contents

The questionnaire	1
Results	2
Age of evaluator	2
Pens	2
Inks	4
Grades	6
Would you buy this paper?	7
Price	7
Potpourri of pros and cons	8
Conclusions	10

The questionnaire

The evaluators were sent three different papers to test. Three 3x5 index cards of each type of paper were included and the evaluators were asked to write on these cards with their inks and pens of choice. The questions asked were (I've paraphrased them):

1. Evaluator's age group (10-19, 20-29, 30-39, etc.).
2. Pens and inks used (most people wrote this information on the cards).
3. Cardstock grades (A = superlative, B = above average, C = average, D = below average, F = quite poor) for each paper type.
4. Would you buy these cards for your own use? Yes or No, along with the reason.

5. Pricing information (give the "Wow, that's a good price", "Yeah, that's about what I expected", and "Wow, they're gouging me" price per card).
6. Pros and cons of each paper.
7. Any additional comments, suggestions, etc.

Results

In the following results, any information that is not given is considered proprietary. Any information given in [square brackets and color] is a comment that I have added. Some things that a few people wrote were a bit hard for me to read, so I apologize if I got it wrong.

A few evaluators wrote the same information on the front and back of the cards; I'm sure they wanted to see if the front and back behaved in the same fashion. Unfortunately, I cut these cards on my wife's paper cutter and I let the cards fall to the carpet. Thus, they were randomly oriented when I picked them up (i.e., since I cut them one at a time, they could rotate in the air on the way down).

Age of evaluator

The percentage of the responders in each decade was as follows:

Age, years	%
10-19	0
20-29	10
30-39	20
40-49	25
50-59	25
60-69	15
70+	0

The mean age of all the responders (using the 5 value as the center of each age range) was 46 years old. Note I've rounded the percentages to the nearest 5%, so they won't add up to 100%.

Pens

The following pens/nibs were used by the evaluators:

- | | |
|-----------------------------------------------|-----------------------------------|
| 1. fidium stub | 20. Edison Herald with medium nib |
| 2. #232 (vintage) Waterman 54 super-flex nib | 21. Edison Pearl steel B stub |
| 3. 1.1 mm stub | 22. Edison Pearl with fine nib |
| 4. 1.1 stub | 23. Esterbrook J 2284 nib |
| 5. 1.15 Pd stub | 24. Esterbrook J 2442 stub nib |
| 6. Ahab | 25. Esterbrook J 2668 nib |
| 7. Aurora factory italic | 26. Esterbrook desk pen F |
| 8. Ballpoint pen | 27. Eversharp Symphony F |
| 9. Bexley Corona with broad nib | 28. Faber Castell Gentleman |
| 10. Bexley stub - factory | 29. Franklin Christopher 0.9 |
| 11. Bexley stub - reground | 30. Hero 383 |
| 12. C.E. Levi Pens "Nox" flexible Swan #2 nib | 31. Hero 616 |
| 13. Delta stub - reground | 32. JH Glass pen |
| 14. Dip nib | 33. Jinhaw 450 |
| 15. Dip pen | 34. Kaweco |
| 16. Diplomat Excellence A M | 35. Kaweco F |
| 17. Duke P06 M | 36. Kaweco Sport Classic B |
| 18. Duke pen (Chinese) | 37. Kaweco dipped |
| 19. Duke vest pen fine nib | 38. Lamy 1.5 |

39. Lamy 2000 BB stub nib
40. Lamy Safari 1.1 mm
41. Lamy Safari 1.5 mm italic
42. Lamy Safari EF
43. Lamy pen [unknown model] with XF nib
44. Levenger True Writer
45. Montblanc 146
46. Montblanc 146 14CM
47. Montblanc 149 BBB
48. Monteverde Invincia M
49. Noodler's Ahab flex
50. Noodler's Ahab flex fine nib
51. Noodler's Flex Nib Creeper
52. Noodler's Flexpen
53. Noodler's resin piston fill
54. Ohto Fine
55. Omas stub - reground
56. Omas w/ Binder italic fine
57. PNS
58. Parker 25 with M nib
59. Parker 45
60. Parker 45 with accountant nib
61. Parker 51
62. Parker 51 Vacumatic (F nib)
63. Parker 75
64. Parker Arrow with F nib
65. Parker Sonnet
66. Parker Sonnet with M nib
67. Parker Vector
68. Pelikan 140 (EF nib with flex)
69. Pelikan 205
70. Pelikan 800 Italifine M nib
71. Pelikan B - reground
72. Pelikan BB ground to italic
73. Pelikan M1000 BB stub
74. Pelikan M1005 EF
75. Pelikan script 1.5 dipped
76. Pelikano Student
77. Pentel 203 0.3 mm mechanical pencil
78. Pentel P201 0.7 mm mechanical pencil
79. Pentel Sunburst Metallic Gel M
80. Pilot 78G B
81. Pilot 78G fine
82. Pilot Falcon MFA nib
83. Pilot Lucina B
84. Pilot Petit 1
85. Pilot Plumix
86. Pilot Plumix M
87. Pilot Precise V7 Gel pen
88. Pilot Prera F
89. Pilot Prera M
90. Pilot Prera MI
91. Pilot Vanishing Point
92. Pilot Vanishing Point with medium nib
93. Pilot Varsity
94. Pilot purse pen with custom grind nib
95. Platignum F italic nib
96. Platinum 3776 music nib
97. Platinum Plaisir F
98. Platinum music pen
99. Plumix M
100. Preppy
101. Preppy F
102. Preppy M
103. Preppy O5
104. Preppy Power Ball
105. Quill
106. Reform 1745
107. Rotring 700 (?)
108. Sailor 1911 (F nib)
109. Sailor Regulus/Industrial Revolution F
110. Sailor Sapporo M
111. Sailor Somiko B
112. Scripto 1960s school pen fine
113. Serwex 101 ?
114. Sheaffer 100 fine
115. Sheaffer Agio F
116. Sheaffer Jr.
117. Sheaffer Lady Skripsert EF
118. Sheaffer Mediterranean cursive italic-oblique
119. Sheaffer Prelude OM
120. Sheaffer Royal Selangor broad
121. Sheaffer School
122. Sheaffer School F
123. Sheaffer School M
124. Sheaffer Targa crisp italic 14K
125. Stipula 1.1 stub
126. Stipula Passaporto
127. Stipula Passaporto 1.1
128. TWSBI 1.1 mm stub
129. TWSBI 530 M
130. TWSBI 540 with broad nib
131. TWSBI broad stubbed
132. TWSBI fine
133. Taccia Merit F
134. Vintage Moore ringtop (semiflex)
135. Visconti Metropolis M nib
136. Visconti Portofino stub nib from factory
137. Visconti Rembrandt M
138. Visconti Rembrandt with medium nib
139. Visconti Wall Street LE M nib
140. Wahl Oxford stub
141. Wardrite F flex wet noodle
142. Waterman 52-1/2 with flex
143. Waterman Phileas
144. Waterman XF flex
145. Weidlich vintage pen XXF nib

- 146. Zebra V-301
- 147. flex nib
- 148. italic nib
- 149. medium round
- 150. medium round nib

- 151. medium round wet
- 152. medium stub
- 153. round Pd fine
- 154. semi flex nib

Here's a count of the different nib types that were used. I counted each ink that was written as one nib (the green background shows writing sticks that weren't fountain pens):

Nib type	Count	Subgroup
Italic	14	45
Stub	31	
Flex	16	16
Fine, XF, etc. round	33	87
Medium round	22	
Broad round	9	
Rounded nib, not otherwise specified	23	
Music	3	3
Glass pen	13	17
Dip pen	3	
Quill	1	
Gel pen	2	6
Ball point pen	1	
Roller ball pen	1	
Pencil	2	
Unknown	11	11

I've used the category "Unknown" not because the evaluator didn't know what pen they were using, but because they didn't write down enough information for me to determine the nib type.

The stub/italic/flex nibs were the ones that tended to stress the papers the hardest with the inks, especially if they were wet writers.

Inks

The following inks were used by the evaluators

- | | |
|-----------------------------------|--------------------------------------------------------------|
| 1. ? | 19. Diamine Tropical blue |
| 2. Akkerman Garuta Rood | 20. Diamine Twilight |
| 3. Akkerman Oranje Boven | 21. Diamine cartridge unknown color
[turquoise to my eye] |
| 4. Apple green [brand not given] | 22. Diplomat Black |
| 5. Aurora Black | 23. Herbin 1670 |
| 6. Aurora Blue | 24. Herbin 1670 + Sheaffer Lavender |
| 7. Ballpoint pen blue ink | 25. Herbin 1670 Hematite |
| 8. Caran d'Ache Mediterranean Sea | 26. Herbin Eclat de Saphir |
| 9. De Atramentis Gingerbread | 27. Herbin Perle Noire |
| 10. De Atramentis Khaki | 28. Herbin Poussiere de Lune |
| 11. Diamine Ancient Copper | 29. Herbin amber |
| 12. Diamine Crimson | 30. Lamy Blue-black |
| 13. Diamine Macassar | 31. Levenger Cardinal red |
| 14. Diamine Mediterranean Blue | 32. Montblanc Blue-black |
| 15. Diamine Pumpkin | 33. Montblanc Irish Green |
| 16. Diamine Sapphire Blue | 34. Montblanc Midnight blue |
| 17. Diamine Sherwood Forest | 35. Montblanc Racing Green |
| 18. Diamine Syrah | |

36. Monteverde Black cartridge
37. Namiki black
38. Noodler's #41 brown
39. Noodler's #41 brown (current)
40. Noodler's Air Corp Blue-black
41. Noodler's American Eel Black
42. Noodler's Bad Belted Kingfisher
43. Noodler's Baystate Blue
44. Noodler's Black
45. Noodler's Black Swan in Australian Roses
46. Noodler's Black Swan in English Roses
47. Noodler's Black cut down a bit
48. Noodler's Blue Nose Bear
49. Noodler's Brown
50. Noodler's Cactus Fruit
51. Noodler's Dumas Tulip Noire
52. Noodler's El Lawrence
53. Noodler's Forest Green
54. Noodler's Golden/41 mix
55. Noodler's Habanero orange with a little Widow Maker red
56. Noodler's Habanero
57. Noodler's Heart of Darkness
58. Noodler's Kung te-cheng
59. Noodler's Legal Lapis
60. Noodler's Lexington Gray
61. Noodler's Navajo Turquoise
62. Noodler's Navy
63. Noodler's Nightshade
64. Noodler's Nikita
65. Noodler's North African Violet
66. Noodler's Ottoman Azure
67. Noodler's Red-black
68. Noodler's Red-black & Dragon's napalm 50:50
69. Noodler's Squeteague
70. Noodler's The Sun Never Sets
71. Noodler's Tiananmen
72. Noodler's Violet Vote
73. Noodler's Widowmaker
74. Noodler's X-Feather
75. Noodler's Zhivago
76. Noodler's Air Corp
77. Noodler's Saguaro Wine
78. Parker Blue-black
79. Parker Penman Emerald
80. Parker Penman Sapphire
81. Parker Quink [black]
82. Parker blue
83. Pelikan Brilliant Brown
84. Pentel HB lead [pencil]
85. Pentel purple metallic gel
86. Pilot Blue-black gel ink
87. Pilot Iroshizuku Asa-gao
88. Pilot Iroshizuku Fuyu-gaki
89. Pilot Iroshizuku Kiri-same
90. Pilot Iroshizuku Kon-peki
91. Pilot Iroshizuku Ku-jaku
92. Pilot Iroshizuku Shin-ryoko
93. Pilot Iroshizuku Shin-ryoku
94. Pilot Iroshizuku Tsutsuji
95. Pilot Iroshizuku Yu Yake
96. Pilot Varsity Blue
97. Pilot purple lead [pencil]
98. Platinum Black (cartridge)
99. Platinum smoke black
100. Preppy Purple
101. Private Reserve Burgundy
102. Private Reserve Copper Burst
103. Private Reserve DC Electric Blue
104. Private Reserve DC Supershow Blue
105. Private Reserve DC Supershow blue
106. Private Reserve DCSS blue
107. Private Reserve Ebony Blue
108. Private Reserve Fiesta Red
109. Private Reserve Naples Blue
110. Private Reserve Sherwood Green
111. Private Reserve Spearmint
112. Private Reserve Tanzanite
113. Private Reserve Tanzanite/Purple Mojo
114. Private Reserve 2003 DC Supershow Blue
115. R&K Alt Goldergrun
116. R&K Kluigher Blau Permanent
117. R&K Sepia
118. Sailor Black (cartridge)
119. Sailor Blue Black (cartridge)
120. Sailor Chu-Shu
121. Sailor Kin Mokusei
122. Sailor Kiraguro Nano Carbon Black
123. Sailor pigment black
124. Scabiosa
125. Sheaffer Skrip Blue-black
126. Sheaffer Skrip Purple
127. Sheaffer's Skrip Blue-black
128. Sheaffer's Skrip washable purple 40's vintage
129. Skrip Jet Black
130. Stipula blue ink cartridge
131. Unknown cartridge
132. Visconti Blue
133. Wancher Black
134. Waterman Black
135. Waterman Florida Blue
136. Zebra black ink cartridge

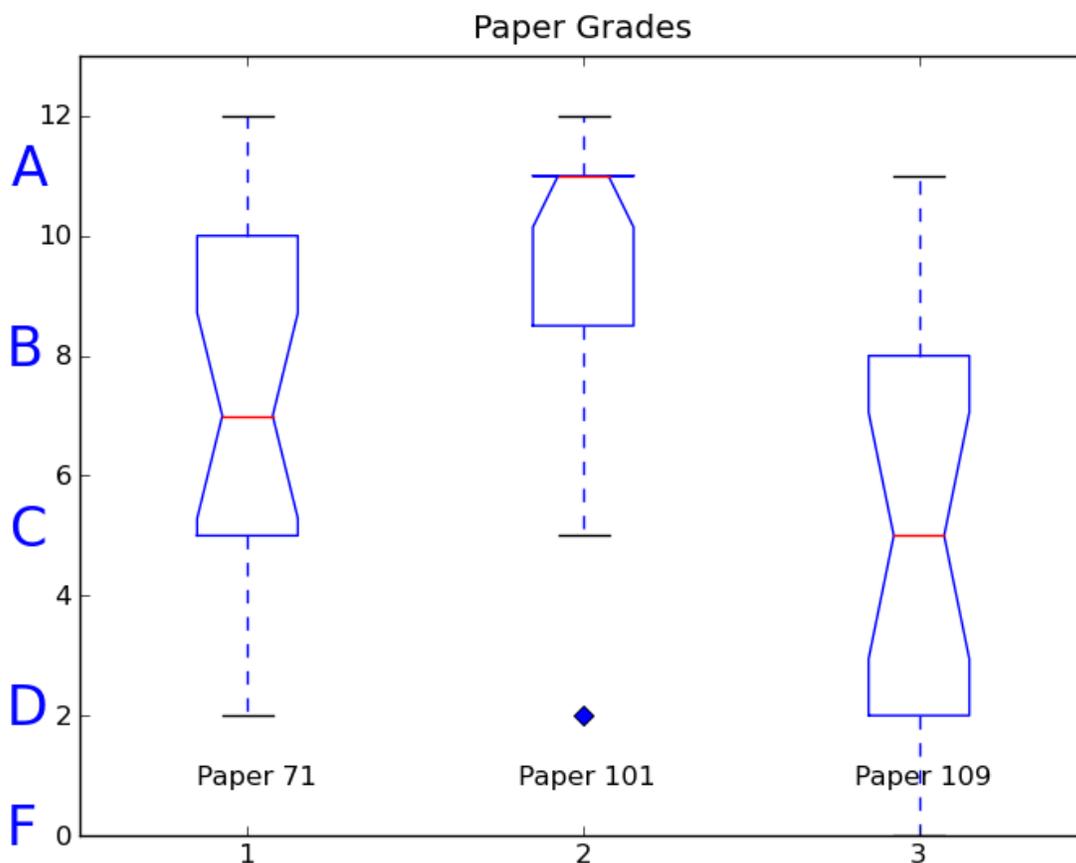
Probably the most stressful ink for bleeding and showthrough was Noodler's North African Violet ink

in a cursive italic-oblique nib (this evaluator also used Baystate Blue in a stub/italic). This evaluator kindly included an Oxford 40153-SP index card (roughly a 10 year old card); I felt the Oxford card performed well, although it had more showthrough than paper 101. Noodler's Lexington Gray and FPN's Galileo Brown are also inks that can feather on many papers with many different pens.

Some of the evaluators put drops of ink onto the paper to look at things like spreading and showthrough. I'm not sure of all the inks that were used for this, but some of them appear to have been Noodler's Red-black, Noodler's black, Noodler's Bay State Blue, and Noodler's Heart of Darkness.

Grades

I converted the evaluator's grades to numbers (F = 0, D- = 1, D = 2, ..., A = 11, A+ = 12) and summarized the grade distributions in a notched box and whisker plot (see http://en.wikipedia.org/wiki/Box_plot):



The median grades are thus:

Paper 71	B-
Paper 101	A
Paper 109	C

About half the people gave grades higher than B- for paper 71 and about half gave lower.

Nobody rated paper 109 as an A+ paper, but some people did so for papers 71 and 101. The ratings extended from F to A for 109. It's clear from these nonparametric measures of central tendency (the red line is the median and the box extends from the 25% to 75% quartiles) that paper

101 is preferred by most folks. Paper 71 was felt to be just slightly better than an average performer and paper 109 tended to be the paper that most folks did not think too highly of (most people didn't like the texture). There was one person who hated paper 101 (there's a small diamond showing his/her rating as an outlier).

One evaluator did an interesting test by printing on each of the cards with an inkjet printer. Each of the printed cards looked acceptable to my eye, although under a 4X loupe, I felt paper 109's printing looked the best and 71's looked the worst (too much bleeding and/or smearing). The evaluator didn't comment on what their opinions were about the printing. However, this evaluator did include an old Levenger card which he/she rated as a B+ (the original cost was 5¢ per card). The Target Up and Up index card at 0.6 ¢ apiece was rated a B- and a Caliber brand card was rated an F.

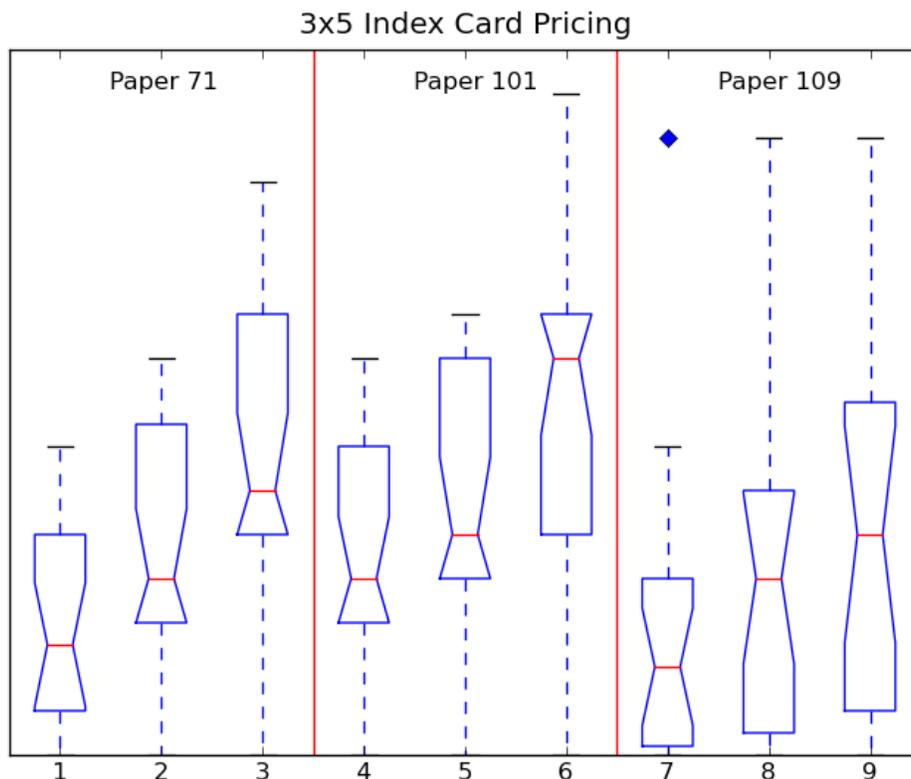
Would you buy this paper?

If a person responded that they weren't sure whether they would purchase a paper or not, I changed that response to a "No". I've rounded the percentages to the nearest few percent.

Paper	Yes	No
71	40%	60%
101	80%	20%
109	20%	80%

Price

Here's a group of notched box and whisker plots for the prices people felt were appropriate for the cards. The first price in a group is one the respondent felt was a good price, the second was an expected price, and the third was felt to be a gouging price. I've removed the actual price data because I consider it proprietary information. Some of the data are skewed downward because I used the value of 0 for price for those people who said they wouldn't buy it (this increases the dispersion). Some people gave a range of prices; I used the average of the two numbers as their price value (example: for the range 10-11, I'd use 10.5).



One of the evaluators declined to write down prices.

Potpourri of pros and cons

There was some ambiguity about terminology. Some folks used the term "feathering" for what I call spreading, which means the paper absorbs enough ink quickly that the written line is wider than it would be on a less absorbent paper. I call feathering the small spikes of ink that branch out from the side of the written line and make it have a jagged edge. Show-through is where the writing on one side of the paper can be seen from the other without the paper being back-lit. Bleeding is where the ink soaks through to the opposite side. In some cases, bleeding that doesn't reach the opposite side's surface can be hard to distinguish from show-through. For show-through, it's important to e.g. lay the paper on a table so that no light is transmitted through the paper. Most papers are translucent enough to show the writing on the other side if held up to light.

One evaluator (I'll call this person "Evaluator X") stated he/she wouldn't buy any of the cards, then gave me excellent data on why. Evaluator X was kind enough to include a number of index card brands that he/she tested besides the one I provided. Evaluator X ranked Paper 101 about equal to some index cards made by Norcom and the Mead 180 cards. I would suggest that if you can find these brands locally, you should give them a try, as it's unlikely I could sell the cards I buy at an equivalent price. I tried the cards X supplied and agree with his/her evaluation, although I did find some of my inks took noticeably longer to dry on these cards than paper 101.

There's too much information to present all the raw data, so I'll summarize various evaluators' comments:

Paper	Pros	Cons
71	Very smooth, doesn't feather, shows shading well, nice white finish, good color character	Feathering, spreading, slight show-through, exaggerates line widths, caused a raised portion where the ink wetted the paper -- similar to Braille.
101	No bleeding, pretty smooth (but with a little texture), sharp line definition, little feathering, no tearing with flex or dip nib,	Still feathers (but harder to see), line width gets reduced, slow dry time, doesn't show ink colors accurately, very little shading, doesn't want to absorb ink, nib doesn't glide on the paper, not friendly towards dry nibs with dry ink (feels "draggy"), hate the feel [of the nib] of these
109	No bleeding, like the texture (makes it feel classy), wide lines emphasize ink color, no glare	Don't like the texture, fine nibs can catch, spreading, worst feathering of all the papers, wicking if the nib snags, too much tooth, slow dry time, bleeding, color shift

My favorite comment was about the pros of paper 71: "Didn't catch on fire and burn my apartment down". ☺ This evaluator also found horrible spreading with flex nibs and feathering with some inks on paper 71. Noodler's Lexington Gray was one of this evaluator's weapons of choice -- and I agree, Lex Gray can feather badly on some papers.

Reading through the raw data gives one a clear understanding of how subjective the experience of writing with a fountain pen and ink can be -- one evaluator would praise a particular paper and the next one would denigrate it. There's no right or wrong, as each person evaluated the paper according to his or her own standards. I am grateful to all the folks who participated and I suspect that many of them spent more than the 15-30 minutes I felt it would take to do the evaluation.

To me, the most interesting data are those provided by the people who gave a paper grades of D or F. I've included their comments here:

Paper	"Cons" comments by people who gave a grade of D or F
71	<ul style="list-style-type: none"> ◆ Makes any pen write like a Sharpie pen.
101	<ul style="list-style-type: none"> ◆ Doesn't want to absorb the ink. Nib doesn't glide on the paper. ◆ Paper actually seemed to fight with the nib; this one is way too hard to write on. ◆ Just not appropriate for fountain pens.
109	<ul style="list-style-type: none"> ◆ Heavy feathering/bleeding. ◆ The texture is rough. ◆ Feathers like crazy, is a sponge. ◆ Feathers! Both Skrip Jet Black and Noodler's Baystate Blue. Bleeds through. Not terribly but definitely noticeable. ◆ Didn't like writing on the textured surface. ◆ Several of my inks spread & feathered on this. ◆ Texture, catches finer nibs. ◆ Line spreads ◆ Small feathering. ◆ Lighter color. ◆ Below current index cards owned. ◆ More see through than #71. ◆ Feathers badly with most inks tried. ◆ Bleed. ◆ Color shift. ◆ I hate linen.

In my experience, feathering and spreading are often related to how fast the ink is absorbed by the paper. This creates a natural tension between drying time and feathering/spreading/bleeding. In general, I've found that the papers that absorb ink quickly tend to feather/spread/bleed more and the papers that tend to take longer to dry will show more shading of inks. Except for a paper that is heavily sized and where ink takes a long time to dry, you will frequently get feathering or spreading if your pen puts enough ink into the written line. I have a wet dip nib that writes a fine line that I can test these three card stocks with and get significant feathering, especially with inks that seem to have lots of surfactant(s), like FPN brown or Lexington Gray.

In contrast, I have papers that are heavily sized and the ink laid down with my pens can take up to 30 seconds to a minute or more to dry. These papers often shade easily; I've even seen some blacks like Noodler's black give a bit of shading. However, I find the drying time too long for my tastes (which is the main reason I don't care for Clairefontaine and Rhodia papers for general purpose use, as they are otherwise excellent papers).

Conclusions

I suggest you check out the Norcom and Mead 180 cards suggested by one of the evaluators (also take a look at Target's Up and Up cards, as they're cheap). These may satisfy your needs for an index card.

In starting a small cottage business like this, the biggest unknown is revenue -- i.e., the actual amount of paper that would sell. I knew this study would do nothing to help me understand this. Thus, I've decided that if I do start a business selling paper, it will start off small, with a few key products and minimal inventory to keep the initial investment down. Then, if there's enough business, the business will bootstrap itself to more products and revenue.

I was hoping that the study would narrow the choices down to one paper. However, this study along with one I did a few years ago indicate that it's nearly impossible to predict exactly what people will like, illustrating the old saw of "one man's meat is another man's poison". This means that I would

offer the papers in this study and expand to other papers later. I do expect the study will roughly reflect the relative revenue of each type of paper over a substantial period of time.

Another uncertainty is what the pricing should be. A number of the evaluators stated they would pay prices below what I actually have to pay for the paper, so clearly I wouldn't be selling paper to them. As I raise the price, the demand falls off; the core question is can I make enough profit to keep the business going and still have enough revenue to justify keeping the business open? I won't know the answer to this question without starting the business and seeing if I can grow it. Another problem is that the shipping cost can add significantly to the overall cost, especially in small quantities -- this can only make the paper less attractive to customers.

A problem with this business is that fountain pen users are such a tiny market -- we're ignorable from the paper companies' perspectives. One company I talked to was quite polite, but wouldn't deal with me unless my paper order involved using a forklift to move it. Another company rather brusquely replied that they wouldn't deal with me because I didn't meet their minimum business standards. Thus, we fountain pen users have to find good papers by simply testing a variety of papers and seeing what works for us.

One thing I concluded in the last study I did is that having an inexpensive sampler pack of the papers I sell will be important to let customers see if they like any of the papers. I've evaluated enough papers that I can test a paper with a few pens and inks and know in short order whether I like the paper or not for fountain pen use.